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STEEL

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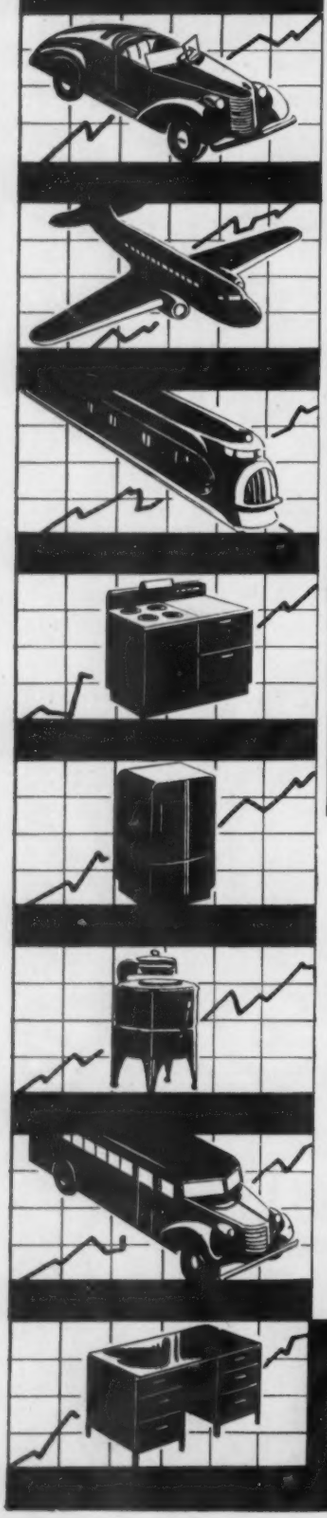
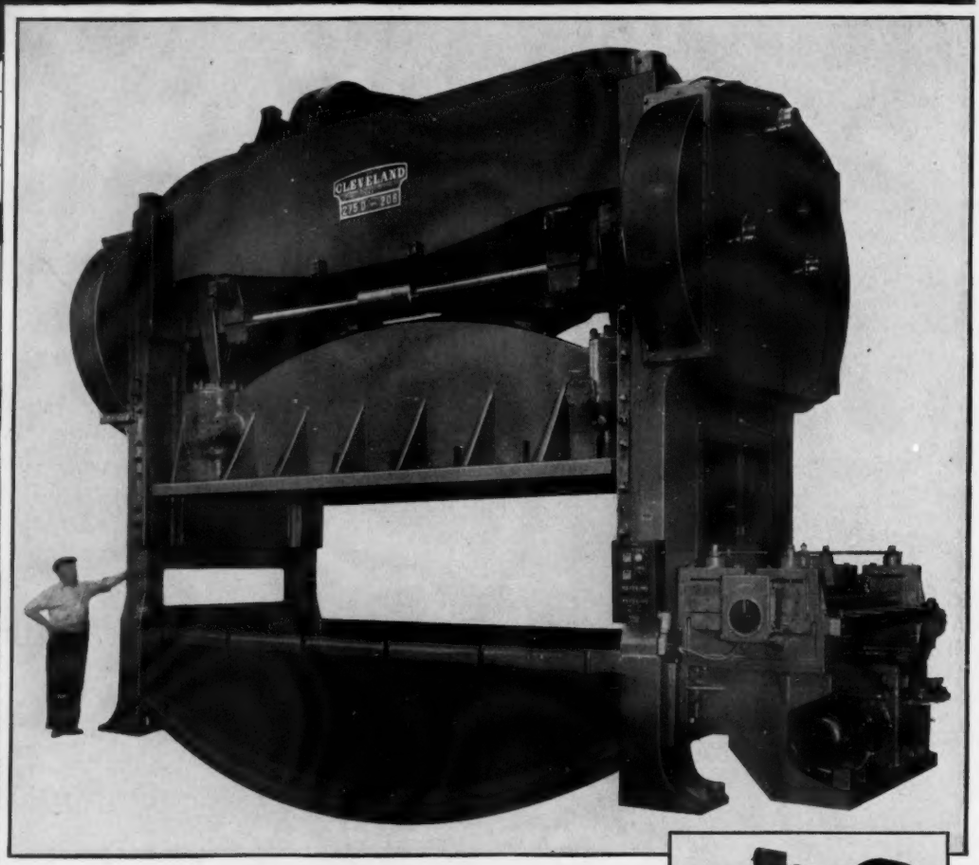
PRODUCTION · PROCESSING · DISTRIBUTION · USE

PRODUCTION GETS A BOOST WHEN "CLEVELANDS" ARE INSTALLED





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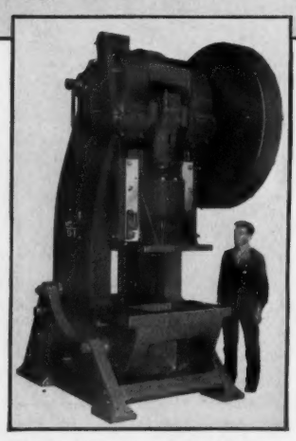

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THE CLEVELAND PUNCH & SHEAR WORKS CO.

Cleveland, Ohio

STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views the News

■ STEEL'S survey of 74 companies which constitute a representative "sample" of the metalworking industry (p. 15) indicates that the average company has a plant improvement program entailing an outlay of approximately $100,000. Of this, $16,452 is to be spent immediately, while the remaining $83,696 is held up, mainly because of political uncertainties. Real encouragement of business by the government at this time, it is shown, would stimulate industrial activity and create more employment. . . . In the meantime, the volume of business is moving slightly downward. Steel production last week (p. 19) underwent another slight decline and now stands at 54.5 per cent of ingot capacity. Automobile production (p. 30) included 85,980 units, a drop of 3400.

• • •

Study Labor Act Revision

Hearings on proposed revisions to the Wagner labor relations act (p. 25) will start before the senate labor committee on April 11 and will continue for two or three weeks. Minimum steel wage order of the department of labor will not become effective until the appeal of eastern steelmakers is decided by the court of appeals of the District of Columbia. War department will oppose any drastic tax measure aimed at taking the profit out of war. A house resolution would authorize an investigation as to the extent to which the machine has displaced labor. . . . For the first time modern air conditioning, aimed at removing moisture and reducing coke consumption, is to be applied to a blast furnace, it was revealed (p. 21) at last week's meeting of the Association of Iron and Steel Engineers.

• • •

Wider Sheets Required

By new methods heat transfer occurs at speeds and uniformity greater than hitherto known, according to discussion (p. 33) at the American Gas association's industrial sales conference. A new boiler liquid vaporizes when heated and is more efficient than steam. Immersion tube heating makes boilers and water heaters 80 per cent efficient. . . . Newly developed for use in melting units (p. 33) are molybdenum briquets; they offer economy and convenience. . . . Hood tops on 1940 automobiles (p. 29) will require sheets up to 88 inches wide and a deeper drawing operation. Front fenders also will require deeper drawing. . . . Weirton Steel Co.'s new rolling capacity (p. 17) for structural shapes, piling and rails, is to be ready for operation in July. . . . Airplane orders (p. 27) continue heavy.

• • •

Testing Auto Parts

A new testing machine subjects automobile parts in a few hours to all the stresses and strains they would meet in years of ordinary use; it is described (p. 38) as "a million miles of rough road in a 10-foot box." . . . A new method of copperplating (p. 40) is claimed to be four times as fast as conventional methods. . . . Considerable confusion now exists with respect to specifications covering insulating firebrick; one authority (p. 42) discusses the various physical and chemical properties of such material in an attempt to clarify this situation. . . . A new magnet (p. 45) lifts 1500 times its own weight. . . . A road machinery builder had trouble because paint stripped off steel members soon after the machines were placed in service; he found a remedy in descaling with the oxyacetylene torch (p. 46) prior to painting.

• • •

Electricity Costs Cut

A kitchen utensil manufacturer (p. 48) has increased efficiency and output through installation of a new enameling furnace and relocation of equipment. . . . An authority (p. 51) describes a system of producing all-welded steel barges with a large proportion of the welds made in the downhand position. . . . A work hardening process which depends on the ability of austenitic manganese steel to harden under impact is said (p. 56) to have a wide range of application. . . . Through instrumentation, one user (p. 63) has been able to effect a material saving in demand charges for electrical current. . . . Newly developed equipment (p. 60) has permitted effective solution of a number of mill drive problems. . . . Painting of inside cylindrical surfaces is simplified (p. 67) by a new machine.

E C Kreutzberg

Are You Pegging for Bigger Profits?

Check the opportunities

You will want the greatest possible value for your dollars that go into steel. You will want the right steel for each purpose.

✔ For example many manufacturers are now obtaining 25% or more weight reduction without loss of structural strength by using Inland Hi-Steel.

✔ Others are adding 300% to 500% longer life when exposed to atmospheric corrosion by using Inland Copper-Alloy which costs but little more per ton than ordinary steel.

✔ Increasing numbers of shops are using Inland Ledloy, the new lead-bearing steel—which permits 30% to more than 100% increased machining speeds.

✔ If you use sheets or strip the right analysis combined with proper heat treatment, finish and uniformity will increase the speed to your forming operations.

Inland men will gladly check these economy possibilities with you. And their personal interest in serving you may result in some excellent methods of lifting your product-appeal or lowering your costs in order to peg profits higher during the coming year.

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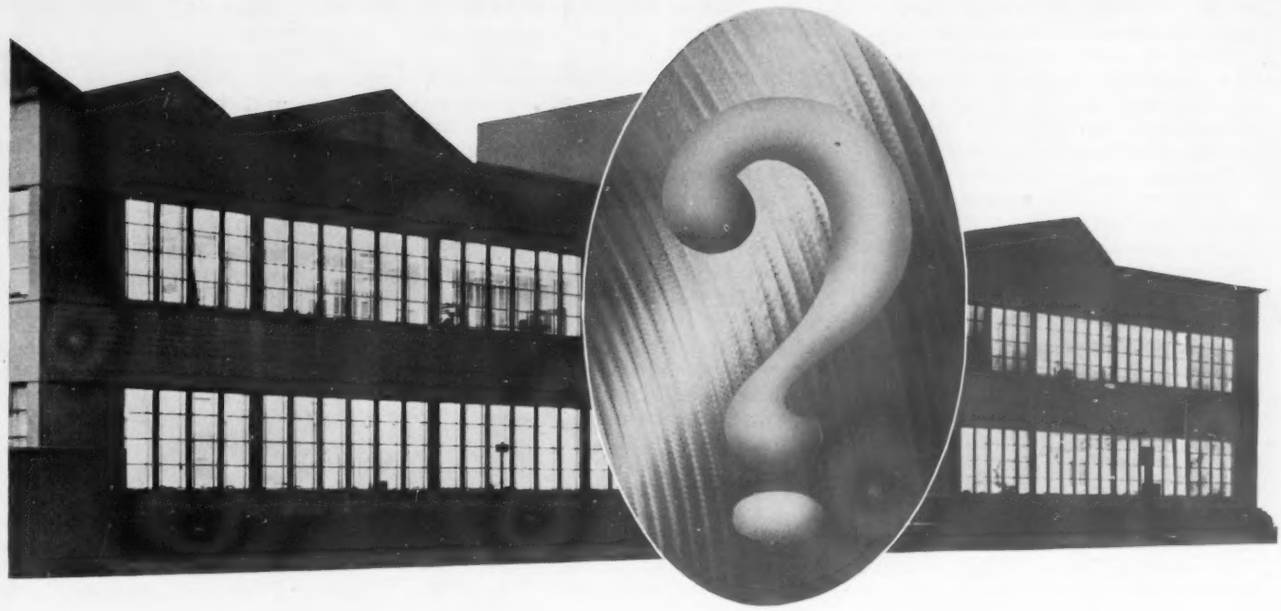
SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS



To Improve, or Not To Improve—

Survey of 74 Metalworking Companies Indicates 51 Plan Expansion To Cost $7,411,000; Only Seven Going Ahead, with $1,217,500 —Political Uncertainties Cause Postponements

■ PLANT expansion and improvement programs are planned by 69 per cent of medium-size metalworking firms, representing every geographical section and a wide variety of products, covered in a survey by STEEL.

Many of these, however, are being held up, pending a more favorable administration attitude, improvement in the business outlook, easier financing, or more settled labor conditions.

Fifty-one of 74 companies said they have plans for improving manufacturing facilities. Of these, 42 said their programs are being postponed; seven are going ahead; one is postponing a part of its program.

Reasons cited by the 42 companies postponing planned programs:

Eighteen definitely expressed dissatisfaction with or fear of New Deal policies.

Seventeen are awaiting improvement in business.

Seven said they found financing difficult or are attempting to preserve their cash positions. Others mentioned labor uncertainties, new products yet in the development stage and fear of the foreign situation.

Twenty-three companies replied they have no plans for improving manufacturing facilities. Two of these have just completed or are completing programs which satisfactorily round out their plants. The others give various reasons for not expanding.

A Mid-Westerner says: "Drouth out here for eight years; and Wallace and Roosevelt on top of that!" Another: "Business is too periodical and must develop a more sustained demand before we can give it (expansion) serious consideration."

83.6 Per Cent Postponed

From Connecticut: "We haven't enough business to keep our present equipment busy." From the Mid-West: "Our present plant is sufficient." Still another: "Under existing circumstances we are not planning on any expansion." Others indicated they have "nothing unusual" or "nothing special" planned.

Total cost of the improvements planned by the 51 manufacturers is estimated by them at $7,411,000. The 42 programs being postponed represent $6,193,500, or 83.6 per cent of the total. Programs going ahead are estimated to cost $1,217,500, or 16.4 per cent of the total planned. Included in the programs being held up is one to cost $3,000,000, which is scheduled to go forward "as soon as conditions warrant."

Twenty-three of the 42 programs involve plant expansion; 37 contemplate additional or replacement machinery and equipment; 16 involve both plant expansion and new equipment.

Important increases in employment would result if the improvement programs were carried through. Only 14 of the 42 manufacturers said their programs would cause no increase. Others estimated employment gains from "slight" to 100 per cent.

Estimated employment increases:

Increase Per Cent	Companies
None	14
Less than 10	2
10 to 25	9
25 to 50	2
More than 50	7
Indefinite	13

Four others estimated they would add 15 to 150 workers each.

Thirteen of the contemplated programs would be at least partially for the purpose of manufacturing new products; 38 for producing the companies' present products.

The new products planned include power plant equipment, new lines of dairy plant equipment, aircraft parts, petroleum equipment, welded plate products, steel stampings, coal handling apparatus, farm implements, electric ranges and machine tools. Several others said they were

developing new products, but were not yet ready to announce them.

STEEL directed its questionnaire to the presidents of the 74 companies, the list being selected with a view to obtaining a representative "sample" of the metalworking industry.

Replies clearly indicate a vast amount of pent-up demand for improved manufacturing facilities.

One president declared: "We are postponing a $50,000 plant construction until we have a change of administration in Washington."

An easterner said: "Purchases withheld pending action of federal government in the matter of taxes, reduction of federal expenses and general attitude toward business."

From a Mid-Western agricultural center: "Lack of business; excessive taxation; governmental interference and restraint of legitimate business; the national labor relations board and its decisions; other unfair labor legislation."

Fears Foreign Policy

A Missourian writes: "Waiting on more favorable tax and labor laws." From the Atlantic seaboard: "Will not make capital expenditures while present policies are continued in Washington regarding labor and taxes; afraid of Roosevelt's foreign policy."

A $200,000 program is held up because "taxes are too high, and the Wagner labor act and other laws recently passed are not conducive to good business."

An Illinois company would buy a considerable amount of machinery and equipment were it not for "uncertainty about the future generally —in spite of Harry Hopkins."

An $85,000 plant is not being built now because of "taxation such as the undistributed profits tax, and the uncertainty of future government action as it affects real business recovery."

A $100,000 plant expansion has been "delayed, first awaiting repeal of undeclared profits tax, and later because of economic conditions."

Believes Outlook Brighter

An Ohioan plans to go ahead with a $40,000 equipment program but is awaiting "more settled political conditions at Washington," believes the situation is "very hopeful at present."

A Wisconsin manufacturer attacks the hours-wages law, the labor board, and tax laws. Minimum wages, he believes, are all right if applied also to co-operatives and equities. But "maximum hours is absolutely crazy. We try to keep our force employed all the law will allow. This allows no leeway for rush seasons . . . . We would have to have enough business instantly available to take double our present output to put on another shift. That is unreasonable."

The same executive believes there should be an exemption in both state and federal tax laws allowing a reasonable rate of interest on money invested.

"The word profit is a misnomer. The first 5 or 6 per cent return on investment is not profit, but is merely interest on the investment. It should not be taxed at all. Personally, I think the next 5 per cent should not be taxed if it is put into a reserve that will be drawn upon for interest on investment and employment during depression periods."

Insufficient volume of business and uncertainty regarding the outlook also is delaying a number of programs. A Philadelphian cites uncertainty as to level of business "which we can expect in the immediate and intermediate future, which uncertainty is principally because our customers have the same uncertainty."

A Virginia company is delaying plant expansion because of "insufficient volume of orders booked ahead. Unsettled labor conditions."

Better Business by July 1

An Indiana company is delaying starting its improvements until July 1. "Expect business in general to be better by then."

Projected $32,000 equipment program of a New York fabricator will be partially carried out "very soon" and the balance before the end of the year.

Financing considerations are delaying other programs. A California concern has postponed building a new steel storage and handling shed because "we wish to build up our cash position first."

A Connecticut company cites: "Inability to borrow capital funds for periods over two months at 6 per cent interest, although triple security by means of real estate collateral is offered."

Another: "The financial situation in this locality for such improvements is out of the question; can get no help from local banks on account of their skepticism of business conditions."

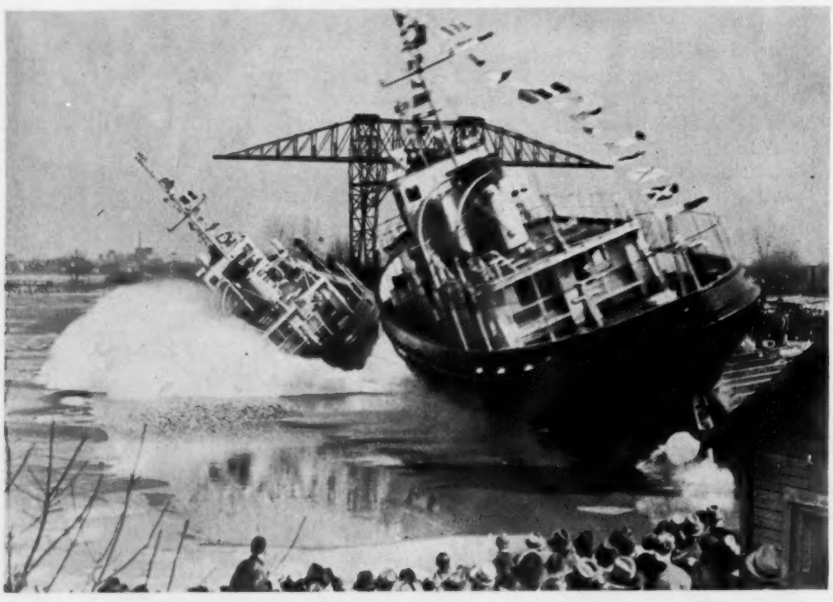
In summary: The 74 metalworking companies show a total of $7,411,000 in projected improvement programs. This indicates an average of slightly more than $100,000 per company.

The projects postponed average $83,696 per company.

The projects not being postponed average $16,452 per company.

For every dollar "going ahead" in investment for improvements to plant or equipment, five are stymied, due to uncertainties—chiefly political.

Welded-Steel Cutters in Twin Launching



■ **Two 110-foot United States coast guard harbor cutters, the Naugatuck and the Raritan, slide down the ways at the Bay City, Mich., yard of the Defoe Boat & Motor Works. Assigned to service at Boston and Philadelphia, the welded steel hull ice breakers are powered with two 8-cylinder V-type General Motors 2-cycle diesel engines, have a speed of 12 knots, cruising range of 3600 miles. Shipbuilding March 1 reached the highest level in several years with 180 under construction; of these, 74 were ocean-going vessels, 105 miscellaneous steel ships**

Germany Loses in Machinery Export Race; Blames Shift in Russian Buying

■ GERMAN machines — especially machine tools—are at a disadvantage in competing for export markets with American and British products, according to the German Institute for Business Research, Berlin.

This realization, it says, is causing considerable concern in the greater reich. Germany needs export business. Last year machinery constituted 17.9 per cent of all her finished goods exported.

While the reich's total machinery exports gained slightly — machine tool exports dropped—she did not share equally in the increased world export trade. How leading exporters shared in world machine trade volume:

Year	Germany	Great Britain	United States	Other Countries
		(Per Cent)		
1929	28	20	32	20
1936	27	26	28	19
1937	26	23	31	20
1938	23	23	33	21

Marked changes in destination of German machine exports also are noted in the institute's current report. Sharp decreases in exports to certain countries have been offset by increased exports to others.

Most severe decline was in shipments to Russia, whose purchases of German machines amounted to 73,000,000 reichsmarks in 1936, 72,000,000 RM in 1937, but only 12,000,000 RM in 1938. Total Russian machine imports are estimated to have increased 20 per cent, and machine tool imports rose 50 per cent. Practically all these orders went to Anglo-Saxon builders. The institute blames this shift by Russia for Germany's failure to maintain her position in the world market.

German exports to Western Europe, North and Central America also dropped.

On the other hand, shipments to Danzig, Poland, the Baltic states and Finland increased 57 per cent. Export successes also were attained in Southeastern Europe; purchases by Rumania, Bulgaria, Greece, Yugoslavia and Turkey gained from 86,000,000 RM in 1937 to 104,000,000 RM in 1938. Gains also were made in the Far East, South America and South Africa.

Austria, Czechia Benefit Reich

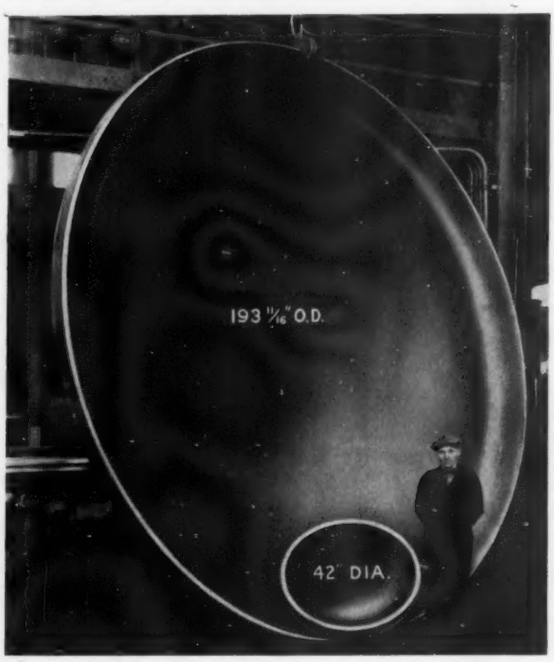
The institute points out the acquisition of Austria improved Germany's position, especially in the Southeastern European market. In Czechoslovakia she also gained machinery capacity.

The shift in German machine exports apparent in the past few years is likely to be intensified. Recent events indicate markets in which buying of German products already has dwindled may become even more difficult for Nazi exporters. Some markets in which Germany has been more successful probably will continue to accept the Nazi barter system; Japan, for instance, and possibly Southeastern Europe. American and British trade campaigns in South America promise Germany keen competition in that large market.

Russia is unlikely to shift back to Germany; nor is Western Europe. Significantly, the British trade commission canceled its trade conference with Germany and proceeded to Moscow.

That the German institute should find German machine tools at a disadvantage in export markets will cause no particular surprise to American machine tool builders. They generally agree German tools rate third in quality, with American tools first and British second. Although German workmanship and design are of high quality, the Nazis' strict economy of metals has resulted in a sacrifice in ruggedness.

To compensate, the Germans have, in the past few years at least, given preference to export orders. Prices for German tools have been considerably lower than prices for comparable American tools. But despite higher prices, United States' share in 1938 world machine exports exceeded its 1929 portion, as shown by the institute's tabulation.



Flanged Head 16 Feet O.D.

■ **Exceptionally large is this flanged and dished head recently turned out by Worth Steel Co., Claymont, Del. Outside diameter is 193 1/16 inches; it has a 3-inch straight flange, 11½-inch knuckle radius, is 27/32-inch gage, required a 220-inch blank**

Weirton To Complete Expansion by July

■ Weirton Steel Co.'s enlarged rolling mill facilities at Weirton, W. Va., will be completed and ready for operation by July. The expansion, costing $5,000,000, will permit rolling a wider range of structural shapes, piling and rails. A feature will be its capacity to roll 180-pound rails.

Shapes to be rolled include angles from 1 x 1 x ⅛-inch up to and including 8 x 8 x 1⅛ inches; I-beams from 3 to 24 inches; H-beams, 4 to 8 inches; wide flange beams with flange widths up to 8¼ inches, depths of sections running to 21 inches; standard channels from 3 to 18 inches; car and ship building channels 3 to 13 inches; car center sills in all sections; car and shipbuilding bulb angles from 4 x 3½ inches to 10 x 3½ inches; rolled tees from 2¾ x 2½ to 6½ x 6½ inches; slit tees within the range of beam sections; zees from 3 to 6 inches; and special sections within the range of the mill. Sheet piling in standard and special sections will also be rolled.

Bar Mill Rates Steady

■ Wage rates in bar mills represented in the Western Bar Iron association, having contracts with the Amalgamated Association of Iron, Steel and Tin Workers, will remain unchanged through April. The rates have been constant since July, 1938.

FINANCIAL

ARMCO NET LOSS $1,307,880 AT 41 PER CENT OPERATIONS

■ AMERICAN ROLLING MILL CO., Middletown, O., reports a $1,307,880 net loss for 1938, after all charges. In 1937, company's net profit was $8,231,334.

Consolidated net sales in 1938 totaled $70,441,606, a decrease of 39 per cent from 1937. Shipments ranged from 29 per cent of capacity in January to almost 60 per cent in December. Monthly average shipments for the year were 41 per cent of capacity.

Chairman George M. Verity and President Charles R. Hook in their message to stockholders stated: "The drastic decline in industrial activity resulted in such low percentage of operations over such a substantial period that, with the constant attack on steel prices by many uninformed persons and with the natural competitive situation, it ultimately resulted in a breaking down of price structures throughout the entire iron and steel industry.

"The new year began with many influences making for upward trends in general business activity. The constant threat of war in Europe and continued political conflict and dissension in this country have created definite retarding influences."

Company's consolidated tax bill for the year was $2,453,506, equal to $2.76 per ton of shipments, or $168.26 for each of the average number of employes.

For new buildings, equipment and other facilities, the company spent $4,803,304. The plant modernization program, taking advantage of slack operations, was carried forward with minimum interference to operating schedules and at reasonable costs.

Cold mill finishing capacity at Middletown was almost doubled with installation of additional warehousing and processing facilities. Coke ovens at Hamilton, O., were increased 33 1/3 per cent; efficiency of Butler, Pa., plant was stepped up; a new sheet mill at Port Kembla, Australia, jointly owned by Armco International Corp. and an English company, started operations in January.

About $3,200,000 of funds earmarked for improvements remains to be expended. Continuous hot mill at Middletown will be rebuilt this summer.

Number of employes on payroll declined from 16,204 on Dec. 31, 1937, to 14,295 on Dec. 31, 1938. Pay rolls fell from $33,769,160 to $23,747,729 in 1938. Hourly wages were unchanged; salaries were reduced 16 per cent during the year.

Commenting on the case brought against the Ashland, Ky., plant by the national labor relations board, the statement says:

"Hearings on that case are now in their tenth month. Direct costs of litigation are already in excess of $100,000. The stenographic record of these proceedings on March 15, 1939, filled 18,534 pages in 120 volumes. The cost of this record alone is $1.10 per page.

"In the light of Armco's unbroken record over a period of 39 years of co-operation and understanding between management and men, this experience demonstrates the need for revision of laws which unnecessarily impose such expenses on business."

INLAND STEEL

Inland Steel Co., Chicago, reports a net profit of $4,916,203, equal to $3.12 per share on 1,577,005 shares of stock outstanding, for 1938. This represents a sharp reduction from the net income of $12,665,317, or $8.05 per share on 1,573,950 shares, for 1937. Ingot operations last year averaged 54 per cent, against 74.8 in 1937. Net sales, $74,058,924, represented a decline of 33 per cent from the 1937 total, $110,744,037. Allowance for taxes in 1938 was estimated at $3,249,814, equivalent to $2.06 per share on the outstanding capital stock.

OTIS STEEL

Otis Steel Co., Cleveland, reports net loss of $1,230,296 for 1938, after depreciation amounting to $1,080,555 and after repairs, maintenance and renewal expense of $1,153,594. The company's statement showed current assets of $9,950,907 against current liabilities of $1,696,576. Capital expenditures last year amounted to $1,170,173. During 1937 the company had a net profit of $2,320,031, equal to $1.71 a share on common stock.

ALLEGHENY LUDLUM

Allegheny Ludlum Steel Corp., Pittsburgh, had a net loss of $1,070,186 in 1938, after all deductions including $1,068,760 for depreciation. In the preceding year the two companies composing the corporation operated independently. Allegheny Steel Co. reported for 1937 a net income of $1,813,707, after all deductions, equal to $2.10 a common share. Ludlum Steel Co. had a net profit of $1,120,422 in 1937, equal to $2.25 per share on common stock. Allegheny Ludlum recorded a net profit in the fourth quarter of 1938, and it is estimated a profit also was made during the first three months of 1939.

♦

Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., had net income of $589,645 in 1938, equal after dividends on 6 per cent preferred stock to $2.31 a share on 99,318 shares of common stock, excluding 682 treasury shares. This compares with $1,471,827, or $11.19 a common share in 1937.

♦

Acme Steel Co., Chicago, reports net profit of $368,168 for 1938. This is equal to $1.12 a share on capital stock, and compares with a net income of $1,898,091, or $5.78 a share, for 1937.

DIVIDENDS DECLARED

Manning, Maxwell & Moore Inc., New York, for first quarter, 12½ cents on common, payable April 3 to record March 31. The last previous dividend was paid July 2, 1938, also 12½ cents a share.

Detroit Gasket & Mfg. Co., Detroit, 25 cents on common, payable April 20. Similar payment was made Dec. 20.

Superheater Co., New York, 12½ cents on common, payable April 15.

Link-Belt Co., Chicago, regular quarterly dividend of 25 cents on common payable June 1.

LABOR

NATIONAL TELLS EMPLOYES STORY OF 1938 BUSINESS

■ NATIONAL STEEL CORP. has explained to employes "The Story of Our Business in 1938" in a 4-page illustrated pamphlet, taken from the annual report to stockholders. Included are a simplified balance sheet, payroll, earnings and sales statistics.

Sales for the year totaled $89,503,232, a decrease of 39 per cent from 1937. Taxes required $5,162,695, 5.77 per cent of the total, or $293 for each employe. Wages consumed $27,608,885, or 30.85 per cent of sales; materials cost $50,070,000, or 55.94 per cent; dividends took $2,168,532, or 2.42 per cent; $4,493,120 was laid aside for contingencies and plant improvements.

Profit in 1938 was $6,661,652, or 63 per cent less than in 1937. Total payrolls dropped 29.7 per cent, from $39,254,007 to $27,608,885. Wage rates were not reduced but decreased production caused less work.

Under "Facts Worth Knowing," the company lists:

"The steel industry as a whole sold about 50 per cent less in 1938 than in 1937. We sold 39 per cent less.

"While our total payrolls were 29.7 per cent less, payrolls in the entire industry fell 37.2 per cent from 1937 to 1938.

"Each employe's job represented in 1938 an original investment of

$12,137.32 for raw materials, mills, buildings, machinery and equipment. In other words, somebody put up more than $12,000 behind each one of us for buildings, tools, and equipment with which we earn our living.

"In 1938, National Steel received 39 per cent fewer sales dollars than in 1937, but out of each $100 collected from customers in 1938, wages took 14.7 per cent more than in 1937, while stockholders received 53.5 per cent less."

STEEL EMPLOYMENT IS HIGHEST IN 11 MONTHS

February steel industry employment at 453,000 was the highest since February, 1938, according to the American Iron and Steel institute. The total compares with 451,000 in January and 461,000 in February last year.

Reflecting a short month, February payrolls of $57,044,000 were below the January total of $59,348,000, but 25 per cent over February, 1938.

Last month wage earners averaged 82.7 cents an hour and worked an average of 33.5 hours a week.

COURT HOLDS "LITTLE NEW DEAL" "GROSSLY UNFAIR"

By unanimous decision Pennsylvania's supreme court last week held unconstitutional four sections of the state's 1937 compensation act, known as former Governor Earle's "Little New Deal." An important feature was an increase in minimum compensation from $7 to $12 weekly, and maximum from $15 to $18.

The court found four provisions "grossly unfair" to employers, "tending to drive out industry."

The four sections voided provided that: Employers were responsible for compensation of employes of subcontractors, whether injured on the employer's premises or not; the employer is "presumed" guilty of negligence because an employe is injured, and that remarks of an injured employe within 12 hours after the accident may be admitted as competent evidence; an employe is entitled to compensation for injuries in the course of employment, even though the result of violating a law, a regulation of the industry or an employer's order; existence of an occupational disease or proof that a workman had been submitted to a physical examination and been dismissed within a year constitutes *prima-facie* evidence of employer negligence.

The court indicated that reasonableness of compensation rates would be tested by comparison with wages earned before the injury, it being unreasonable to pay compensation higher than normal earnings.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended April 1	Change	Same week 1938	Same week 1937
Pittsburgh ...	49	+ 1	32	95
Chicago	53.5	— 3	32.5	84
Eastern Pa...	40	None	29	59.5
Youngstown..	50	— 4	30	86
Wheeling	66	+ 3	41	96
Cleveland ...	52.5	None	33.5	79.5
Buffalo	42	+ 4.5	30	89
Birmingham..	62	—16	66	80
New England	50	—15	20	85
Cincinnati ...	51	— 4	18	80
St. Louis.....	43	—14.5	46.5	82
Detroit	74	+ 2	18	100
Average....	54.5	— 1	36	91.5

PRODUCTION

■ STEELWORKS operations last week declined 1 point to 54.5 per cent, with reductions in six districts and gains in four. A year ago the rate was 36 per cent; two years ago 91.5 per cent.

Youngstown, O.—Receded 4 points to 50 per cent, with three bessemers and 42 open hearths active. Four open hearths were taken off, but two were added late in the week. Schedules for this week indicate a rise of 1 point to 51 per cent.

Cleveland—Unchanged at 52.5 per cent. An increase by one mill is expected this week.

Detroit—Up 2 points to 74 per cent, 18 of 26 furnaces operating.

Chicago—Down 3 points to 53.5 per cent, following curtailment by a leading interest and an independent.

St. Louis—Dropped 14.5 points to 43 per cent, as three producers reduced production.

Cincinnati—Off 4 points to 51 per cent, after remaining close to 55 per cent for several weeks.

Pittsburgh—Slight increases by important producers caused an advance of 1 point to 49 per cent.

Wheeling — Increased bessemer production moved the rate up 3 points to 66 per cent.

Central eastern seaboard—Held at 40 per cent for the fourth consecutive week.

New England—Receded 15 points to 50 per cent as important producers reduced output.

Birmingham, Ala.—Removal of two open hearths each by two leading producers caused the rate to fall 16 points to 62 per cent.

Buffalo—Lighting of two additional open hearths by Bethlehem Steel Co. lifted the rate 4.5 points to 42 per cent, the highest in two months, a rise of 10 points in three weeks.

Action on War Exports, Stocks

WASHINGTON

■ NEUTRALITY legislation and acquisition of strategic and critical mineral stockpiles held congress' attention last week. Representative Hamilton Fish, New York, offered in the house a new neutrality bill prohibiting sale and shipment of arms and ammunition to belligerents. For the "cash and carry" provisions of the present bill, expiring in May, Fish provided American ships may carry such materials as scrap iron and steel to belligerents at shipowners' risk.

Representative Coffee, Washington, introduced a bill in the house to prohibit exports of arms, ammunition, scrap iron and steel, scrap tin and other metal products.

These bills followed reports the President had asked legislative leaders to either repeal or drastically modify the present law.

The senate on Friday passed a bill providing for the acquisition of strategic mineral stockpiles, but authorized expenditure of only $40,000,000 for this purpose instead of the $100,000,000 originally provided.

Still pending in the house is a similar bill, favorably reported by the house military affairs committee (STEEL, March 27, p. 26). The military affairs committee reported it considered the problem from two angles: First, solely as a national defense measure; second, as a measure to develop our national resources of strategic raw materials.

Stockpiles recommended by the committee: Manganese ore, 554,000 long tons; chrome ore, 250,000 long tons; tungsten ore, 2250 short tons; tin 85,000 short tons.

Adjusting Wage Rates At Pittsburgh Steel

■ Negotiations between Pittsburgh Steel Co. and the Steel Workers Organizing committee were in progress last week to adjust tonnage rates for some workers in the company's open-hearth department where mechanical improvements have increased output 60 to 70 per cent. Company spokesman stated the reduction will amount to between 10 and 15 per cent of wages affected.

Since their rates have been increased substantially by reason of the increased production the actual pay will not go below levels accepted by the union at the time the contract was signed in the spring of 1938. Negotiations are under section 11 of the contract, which permits adjustment in rates.

March Pig Iron Production Up 4.9 Per Cent; Two Stacks Added

■ PRODUCTION of coke pig iron in the United States continued the upward trend started in February, showing a daily average output in March of 77,182 gross tons, an increase of 3604 tons, or 4.9 per cent, over the average 73,578 tons in February. This was the highest daily rate since October, 1937, with 93,259 tons. In March, last year daily output averaged 47,426 tons.

Total production in March was 2,392,629 gross tons, higher by 332,446 tons, or 16.2 per cent, than the February total 2,060,183 tons, and the largest monthly output since October, 1937, when 2,891,026 tons were produced. In March, 1938, production was 1,470,211 tons.

MONTHLY IRON PRODUCTION

Gross Tons

	1939	1938	1937
Jan.	2,175,423	1,444,862	3,219,741
Feb.	2,060,183	1,306,333	3,020,006
March	2,392,629	1,470,211	3,470,470
Tot. 3 mo.	6,628,215	4,221,406	9,710,217
April	.....	1,388,008	3,400,636
May	.....	1,260,937	3,545,180
June	.....	1,060,747	3,115,302
July	.....	1,213,076	3,501,359
Aug.	.....	1,495,514	3,616,954
Sept.	.....	1,683,097	3,417,960
Oct.	.....	2,067,499	2,891,026
Nov.	.....	2,286,661	2,007,031
Dec.	.....	2,212,718	1,503,474
Total	.....	18,889,663	36,709,139

Output for the first three months of 1939 aggregated 6,628,215 tons, an increase of 2,406,809 tons, or 57 per cent, compared with corresponding period in 1938 when 4,221,406 tons were made. Output for first three months of 1937 totaled 9,710,217 tons.

Relating production to capacity, operations in March averaged 56 per cent. This is the highest since January, 1937, with 76.6 per cent, and compares with 53.5 for February and 51 in January. High point in 1938 was in November with 55 per cent.

Number of stacks in blast March 31 was 123, a net gain of two. Four steelworks or nonmerchant stacks resumed and two were blown out or banked. In the merchant list, the two added were counterbalanced by two taken out. The March total of 123 compared with 115 in January, and 90 in March, 1938. The March, 1939 figure was highest since October, 1937, when 151 were in blast.

Furnaces resuming during March were: In Indiana: Gary No. 4, Carnegie-Illinois Steel Corp. In Ohio: River No. 1 and Youngstown No. 2, Republic Steel Corp.; Hubbard, O. No. 1, Youngstown Sheet & Tube Co. In Pennsylvania: Neville Island, Pittsburgh Coke & Iron Co.; Monongahela No. 2, National Tube Co.

Stacks blown out or banked were: In Alabama: Ensley No. 1, Tennessee Coal, Iron & R. R. Co. In New York: Standish, Chateaugay Coal & Iron Co. In Ohio: Steubenville No. 1, Wheeling Steel Corp. In Pennsylvania: Shenango, Shenango Furnace Co.

AVERAGE DAILY PRODUCTION

Gross Tons

	1939	1938	1937	1936
Jan.	70,175	46,608	103,863	65,461
Feb.	73,578	46,655	107,857	63,411
March	77,182	47,426	111,951	66,004
April	.....	46,267	113,354	80,316
May	.....	40,675	114,360	85,795
June	.....	35,358	103,843	86,551
July	.....	39,131	112,947	83,735
Aug.	.....	48,242	116,676	87,475
Sept.	.....	56,103	113,932	90,942
Oct.	.....	66,694	93,259	96,509
Nov.	.....	76,222	66,901	98,331
Dec.	.....	71,378	48,499	100,813
Ave.	73,647	51,752	100,573	83,832

Tin Output Reduced

■ World tin production in January totaled 15,900 gross tons, compared with 9300 tons in December and 13,900 tons in January, 1938, according to International Tin Research and Development council.

For 12 months ending January, 1939, world output was 150,000 tons, 27 per cent less than 207,700 tons in the preceding 12.

World apparent tin consumption in January was 11,300 tons, the same as in December. In January, 1938 consumption amounted to 13,900 tons. For 12 months ended January, 1939, the amount was 149,000 tons, 24 per cent less than 196,500 tons in the preceding period.

World tin plate production in January was 270,000 tons, compared with 250,000 tons in December, and 241,000 tons in January, 1938.

MARCH IRON PRODUCTION

	No. in blast last day of Mar.	No. in blast last day of Feb.	Total tonnage Merchant	Total tonnage Nonmerchant
Alabama	14	15	73,936	159,270
Illinois	9	9	33,925	181,121
New York	8	9	44,505	91,888
Ohio	30	28	68,094	491,164
Penna.	35	34	28,333*	639,506*
Colorado	2	2		
Indiana	10	9	6,498*	395,797
Maryland	4	4		
Virginia	1	1		
Kentucky	1	1		
Mass.	0	0		
Michigan	4	4		
Minnesota	1	1	6,428	172,164
Missouri	0	0		
Tenn.	0	0		
Utah	1	1		
West Va.	3	3		
Total	123	121	261,719	2,130,910

*Includes ferro and spiegeleisen.

February Farm Tool Exports Decline 41%

■ Farm equipment exports in February totaled $3,870,645, a decline of 41 per cent from $6,602,373 in February, 1938, with all major types sharing in the reduction, states the machinery division, department of commerce.

Tractors and parts showed a loss of 46 per cent, $2,725,056 compared with $5,050,049 a year ago. Tillage implements dropped 32 per cent and harvesting machinery 31 per cent. Seed separators gained 83 per cent, from $26,779 a year ago to $49,080 in February.

RATE OF OPERATION

(Relation of Production to Capacity)

	1939[1]	1938[2]	1937[3]	1936[4]
Jan.	51.0	33.6	76.6	48.2
Feb.	53.5	33.6	79.5	46.4
March	56.0	34.2	82.5	48.5
April	....	33.4	83.7	59.1
May	....	29.4	84.3	63.1
June	....	25.5	76.6	63.6
July	....	28.2	82.9	61.5
Aug.	....	34.8	85.7	64.3
Sept.	....	40.5	83.7	66.9
Oct.	....	48.0	68.4	71.0
Nov.	....	55.0	49.3	72.3
Dec.	....	51.4	35.6	74.2

[1] Based on capacity of 50,198,920 gross tons, Dec. 31, 1938; [2] capacity of 50,606,400 gross tons, Dec. 31, 1937; [3] first half on capacity of 49,512,737 tons, Dec. 31, 1936—second half on capacity of 49,727,737 tons, June 30, 1937; [4] capacity of 49,777,893 tons, Dec. 31, 1935. Capacities by American Iron and Steel institute.

Features Alloy Steels

■ Allegheny Ludlum Steel Corp., Pittsburgh, has introduced a new house publication, *Steel Horizons*, "a preview of steels of today and tomorrow." Devoted especially to stainless and other alloy steels, the magazine will be published six times a year.

First issue describes the company's development of special steels, uses and outstanding fabrications made of the company's stainless.

Southern Iron and Steelmaking Reviewed at Birmingham Meeting

BIRMINGHAM, ALA.

■ COINCIDENTAL with the annual spring conference of the Association of Iron and Steel Engineers held at Hotel Tutwiler here, March 27-28, is the fact that 20 years ago the Birmingham section of the association was founded. On March 27, 1919, the late John Kelley Sr., Charles Mink and A. H. Schwartz met in this city and arranged for the first meeting which was held one month later.

Last week the association held its first national meeting in Birmingham with over 500 in attendance. Following the technical session Monday, at which three papers were presented, members and guests met for lunch and then were taken by buses to the plant of the American Cast Iron Pipe Co.

H. A. Travers, power assistant engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., whose paper on "Relay Protective Methods for Steel Mill Service," was presented by G. E. Stoltz of the same company, reviewed the several hazards to which mill motors are subjected and cited means of protection. He pointed out that certain abnormal conditions develop rapidly in the case of short circuiting and urged that the electrical unit should be isolated from the system. Synchronous motors under such conditions reverse their action and function as generators. He presented a diagram to show how current backflow is handled by a differential system.

Overheated bearings on motor units are now common practice. A temperature relay often is employed on bearings to sound an alarm when the temperature exceeds the normal operating rate. Unless the attendant is able to cool the bearing, the machine is tripped off the line, he explained. Undervoltage protection frequently is provided by a voltage transformer on the motor or bus. The speaker favored a time relay rather than one of the instantaneous type. The speaker referred to the trend to equip sheet mill equipment with lightening arrestors.

Speed Stepped Up

Frank Cramer, electrical engineer, Carnegie-Illinois Steel Corp., Pittsburgh, in discussing this paper, stated that synchronous motors have changed since the development of the wide strip mills. Today, the speed has been stepped up to 2000 feet per minute. Grounding, he stated, seems to be an indeterminate quantity. He drew attention to the fact that because of the many gadgets added to electric equipment a new type of motor inspector is required at the mill.

Of a total of 2,000,000 tons of wire produced in this country annually, about 475,000 tons went into nails, 7500 tons into coat hangers, and 23,000 into fly screens. This fact was brought out by J. J. Phifer, superintendent Fairfield Wire Works, Tennessee Coal, Iron & Railroad Co.

The art of drawing wire has undergone little change, the speaker stated, but since 1920 many weaknesses in the machines have been eliminated. Many attempts have been made to insert a clutch in the drawing block in order to avoid abrupt starting but with little or no success. Improvement in continuous wire drawing equipment was more rapid in copper than in steel, he stated, because the early designs were based on the principle of slippage which could be tolerated in the wet-drawing process used in copper than in the dry process practiced in steel.

He drew attention to individual wire drawing blocks driven by a single motor as having a wider size range and greater adjustability. The speed of these units is set by a hand rheostat while back tension is provided by springs in the frames. Slippage is reduced to a minimum. Double-deck blocks, the speaker pointed out, frequently are provided with a spindle for extra passes. In his opinion, it is best to use a double-deck block for the first draft.

Closer Tolerances

Machines now are available for drawing low-carbon wire from 1000 to 1500 feet per minute. He emphasized the advantage of using tungsten carbide dies and cited one instance where 30,000 pounds of wire was drawn through a die of this type with the start and finish of the wire well beyond the tolerance. The trend is toward higher speed in drawing heavier bundles, closer tolerances and better lubrication. The speaker mentioned proper rolling, cleaning and coating, as contributory to successful wire drawing. He credited steelmakers for many of the advances in wire drawing practices in supplying workable material.

Lubrication in the steel mill is the most difficult of all fields, according to William Mandy, The Texas Co., Birmingham, Ala. Due consideration to the efficiency of lubricants requires the proper application, he stated. It depends on the location of the mill and the type and age of the mill. Mills located near a source of cool water have the advantage over mills depending on reclaimed water for cooling purposes. Where cold water is not available, he stated, high-melting point lubricants are required.

High-grade engine oil is not recommended for worn line shaft bearings. In modern mills a high-quality lubricating product should

(*Please turn to Page* 64)

■ **Iron and steel engineers meeting in Birmingham, Ala., last week were welcomed by Robert Gregg, president, Tennessee Coal, Iron & Railroad Co. Left to right: Mr. Gregg, C. C. Wales, president, Association of Iron and Steel Engineers; A. H. Schwartz, one of the founders of the association's Birmingham chapter; Karl Landgrebe, vice president, Tennessee company, and Charles Bradford, district manager, Republic Steel Corp.**

MEN OF INDUSTRY

■ ALEXANDER E. WALKER, executive vice president, Pittsburgh Steel Co., Pittsburgh, since Jan. 1, 1937, has resigned to become vice president and a director, National Supply Co., Pittsburgh.

Before joining Pittsburgh Steel, Mr. Walker was general manager of sales, Republic Steel Corp., Cleveland, and also was president of Truscon Steel Co., Youngstown, O., a Republic subsidiary. Mr. Walker has been identified with the steel industry since graduation from the University of Michigan in 1910. He joined LaBelle Iron Works, Steubenville, O., now a part of Wheeling Steel Corp. in 1911, and later was assigned to the company's Chicago sales office. In February, 1916, he joined Republic as assistant manager of pipe sales; in 1919 was named assistant general manager of sales, and in 1928 general manager of sales. Mr. Walker became president of Truscon in 1936.

♦

G. H. Newton, president, Graver Tank & Mfg. Corp., East Chicago, Ind., is again at work after a serious operation and several weeks recuperating in Miami, Fla.

♦

Andrew M. Kennedy, vice president, Pittsburgh Coke & Iron Co., Pittsburgh, has been elected a director, Sharon Steel Corp., Sharon, Pa., replacing John M. Wilson.

♦

H. Edward Manville has been appointed chairman of the board, Johns-Manville Corp., New York. He succeeds the late William R. Seigle.

♦

Edward W. Hill, assistant superintendent, open-hearth deartment, Duquesne works, has been transferred to the Clairton, Pa., plant of Carnegie-Illinois Steel Corp., as superintendent of open hearths.

♦

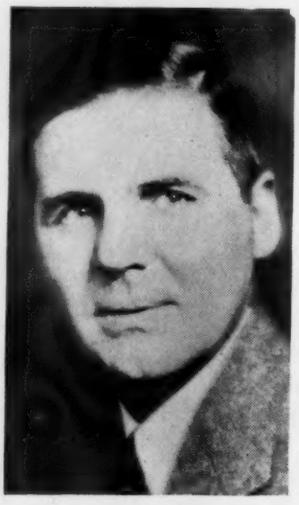
William Burwell, Joseph Couden, George Crabbs, Robert Hazlett, Isaac M. Scott, all of Wheeling, W. Va., and Crispin Oglebay, of Cleveland, have been re-elected directors, Wheeling Steel Corp., Wheeling, W. Va.

♦

Ervin J. Sanne has been appointed assistant manager of sales, sheet and strip steel division of the sales department, Inland Steel Co., Chicago, effective May 1. He has been district sales manager of Inland at St. Paul since 1936, and prior to that time was associated with Joseph T. Ryerson & Son Inc., now a subsidiary of Inland. He joined Ryerson in 1917 and was active in the sales department at Chicago from 1921 to 1936.

Alexander E. Walker

Frederick A. Ernst



Ervin J. Sanne

Frederick A. Ernst, assistant district sales manager at St. Louis since 1936, has been named district sales manager at St. Paul, succeeding Mr. Sanne. His appointment also is effective May 1. Mr. Ernst entered the steel industry in 1914 with Trumbull Steel Co. and was successively affiliated with the Falcon Steel Co., Granite City Steel Co. and Columbia Steel Co. prior to his association with Inland in 1928.

Harry A. Johnson, who joined Inland at Chicago in 1933 and was on the sales staff of the Milwaukee district sales office from 1935 through 1938, has been named assistant district sales manager at St. Paul, effective at once.

♦

Joe Fal, service man for Warner & Swasey Co., Cleveland, with headquarters in Houston, Tex., is going to France temporarily to supervise a large installation. During his absence he will be succeeded by Elmer Wrobbel, who has been doing service work for the company in the northeastern part of the country.

♦

George J. Helfrich has been appointed Chicago district sales manager, Reading-Pratt & Cady division of American Chain & Cable Co. Inc., with headquarters at 400 West Madison street. He has been associated with the company since 1925.

♦

W. W. Peattie, president, Northern Engineering Works, Detroit, has been elected chairman, Electric Hoist Manufacturers association, New York. He succeeds J. F. Cooke, American Engineering Co. William White, secretary and general manager, Euclid Crane & Hoist Co., Euclid, O., has been elected vice chairman of the association.

♦

B. D. Landes has been appointed general sales manager, H. K. Porter Co., maker of industrial locomotives, Pittsburgh. A graduate of Purdue university, Mr. Landes was manager of engineering service for the A. M. Byers Co., Pittsburgh, and before that was associated with Harnischfeger Corp., Milwaukee.

♦

Carl L. Halpin has resigned as purchasing agent, Square D Co., Detroit, to become associated with Fisher Body Corp., Grand Rapids, Mich. E. W. Tiderington, who for several years was assistant purchasing agent at Square D and later was in the purchasing department of Ainsworth Mfg. Co., has been named to succeed Mr. Halpin.

♦

Whipple Jacobs, vice president in charge of sales, Belden Mfg. Co., Chicago, has been elected president, to succeed the late Joseph C. Bel-

den. Hopewell L. Rogers, heretofore vice chairman, has become chairman of the board, also succeeding Mr. Belden. Charles S. Craigmile, a vice president, and Herbert Pope, attorney, have been elected new directors, to replace Mr. Belden and John W. O'Leary, who resigned.

♦

Donald J. Riddell, formerly welding specialist, Philadelphia works, General Electric Co., has been named eastern district representative for Progressive Welder Co., Detroit. Mr. Riddell's territory will include all states east of Ohio, with headquarters at 2308 Chestnut avenue, Ardmore, Pa.

♦

H. N. Ott, since 1919 president, Spencer Lens Co., Buffalo, has been elected chairman of the board. He has been succeeded as president by B. H. Witherspoon, who has been active in the management of Spencer Lens since 1935, serving as a member of the executive committee, and vice president and general manager. Mr. Witherspoon, also a director of Pittsburgh Testing Laboratories and president of Optical Glass Products Inc., Hamburg, N. Y., retains the position of general manager.

H. N. Ott

B. H. Witherspoon

Donald J. Riddell

Other officers elected are: H. D. Rhynedance, vice president and general sales manager; B. Glenny, treasurer, and C. W. Barton, secretary and manager of research and development.

♦

Mrs. Jean Shassere Mills, one of the few steel saleswomen in the industry, is retiring from business following her marriage March 25 to Robert L. Mills, a merchant of Robinson, Ill. Mrs. Mills entered the steel business in Terre Haute, Ind., in 1920 as representative of a Chicago company, later going to Chicago. She obtained orders for the structural steel used in many large Chicago buildings.

♦

Directors of National Steel Corp., Pittsburgh, were re-elected at the annual meeting of stockholders March 27. They are E. T. Weir, chairman; Frank W. Blair, Maurice Falk, George R. Fink, Howard M. Hanna, George M. Humphrey, Thomas E. Millsop, Edmund W. Mudge, Carl N. Osborne, Murray W. Sales, and Charles M. Thorp.

DIED:

■ CHARLES BERNARD MURRAY, 73, president, Crowell & Murray, chemists, mining engineers and metallurgists, Cleveland, March 25, by automobile accident. Born in Worcester, Mass., April 6, 1866, he graduated as bachelor of science from Worcester Polytechnic institute in 1887 and in 1937, on the fiftieth anniversary of his graduation, was awarded an honorary degree of doctor of engineering by the institute.

On graduation he became assistant chemist with Joliet Steel Co., Joliet, Ill., now part of Carnegie-Illinois Steel Corp. He was made chief chemist and metallurgist at Edgar Thomson works of Carnegie Steel Co., Pittsburgh, in 1893. In 1904 he established a commercial laboratory in Pittsburgh and in 1907 moved to Cleveland and with Benedict Crowell formed the firm of Crowell & Murray. The book, *Iron Ores of Lake Superior*, was issued by the firm under Mr. Murray's supervision.

He was a member, American Institute of Mining and Metallurgical Engineers, American Chemical society, Society of Chemical Industry, American Iron and Steel institute, American Society for Metals, Lake Superior Iron Ore association, Cleveland Engineering society and was a member of the executive board, American Society for Testing Materials.

♦

Virgil J. Tibbitts, 33, superintendent, Ohio Nut & Bolt Co., Berea, O., March 26 in that city.

♦

John E. Nelson, 60, general manager, Duluth branch, Republic Steel Corp., in that city, March 29. He had been in the employ of the company 40 years.

♦

Otto Kafka, 59, head of the steel exporting firm of Otto Kafka Inc., New York, March 24 at his home in Bayside, Queens. In 1916 he organized the American Steel Export Co. and Vulcan Steel Products Co., in association with T. Coleman duPont, continuing with those firms until 1919 when he went into business for himself.

♦

Elwood Burdsall, 82, secretary-treasurer, Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y., March 10. Following graduation from Cornell university in 1878 with a degree in mechanical engineering, he joined the Bolt & Nut company which his father and William E. Ward had founded in 1845. He became secretary in 1901 and secretary-treasurer in 1915. Mr. Burdsall was a member, American Society of Mechanical Engineers, and had various other business and organization affiliations.

♦

Rowland S. LeBarre, 61, sales representative for Republic Steel Corp., in Detroit, March 26. Prior to opening a Detroit office in 1924 for Interstate Iron & Steel Co., Chicago, which later became part of Republic, Mr. LeBarre represented the Illinois Steel, Carnegie Steel and American Sheet & Tin Plate companies in New Orleans from 1902 to 1905 when he was transferred to Cleveland to handle sales for Illinois and Carnegie. In 1919 he was made general manager of alloy sales for Interstate.

QUALITY AND SERVICE

A close control of quality is possible because the basic raw material is made in our Phillipsdale, R. I., mill where steel craftsmen follow rigid specifications. Each lot comes to New York with an identification tag telling the exact content. As your order goes through both plants, samples are taken at various stages for checking specifications and a percentage of each operation is examined microscopically. This strict attention to Uniform Quality and Good Service have made a valued list of customers who always rely on Washburn.

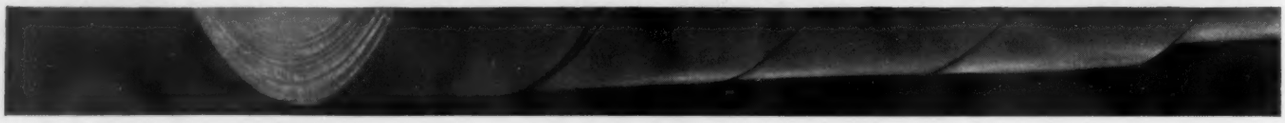
WASHBURN FLAT STRIP

is available in untempered and tempered forms and can be furnished with Bright, Galvanized, Tinned and Cadmium Finishes. Widths from 1/16" to 6" and thicknesses from .004 to .125.

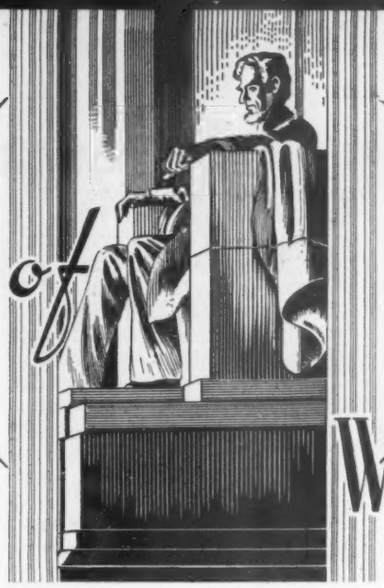
WASHBURN WIRE CO., NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES



Windows of WASHINGTON



By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ HEARINGS will be started before the senate labor committee April 11 on proposed amendments to the Wagner labor relations act. Hearings have been postponed due to opposition by the CIO and because President Roosevelt believed they should not go ahead while the CIO and AFL were conducting "peace" negotiations.

Senator Wagner, New York, author of the bill, will be the first witness followed by four proponents of amendments: Senators Walsh, Massachusetts, Burke, Nebraska, Holman, Oregon, and Logan, Kentucky. Witnesses representing the national labor relations board, labor department, AFL, CIO, and business interests also will be heard. The detailed calendar has not yet been arranged.

Fundamental changes are proposed by some pending amendments, Senator Walsh's amendments are supported by the AFL. Among other things they seek to curtail the discretionary powers of the labor board and broaden the right of appeal to the courts from the board's decisions. It is anticipated the hearings will continue for two or three weeks and those in charge have indicated action taken by the committee will be swift enough to permit congressional action at the present session.

Revision of the act was urged last week by the National Association of Manufacturers which claims labor strife will persist until all persons "stand equally before the law." The association in a statement asked the law be amended on eight major counts and the association's statement was accompanied by a symposium of public opinion throughout the country.

The symposium embraced expressions critical of the act or its administration by legislators, labor leaders, business men, newspapers, columnists, judges, lawyers, farmers, doctors, educators and the general public.

The position of the National Association of Manufacturers, as outlined by the statement, is "that there can be no permanent solution of labor problems so long as the law places restraints upon one party to the employer-employe relationship, and leaves the other party free of all restraint."

It added: "Neither can there be a permanent solution until the right of free association on the part of employers and freedom of action on their part so long as they do not commit unfair practices, is recognized to the same extent as it is in the case of employes; nor can there be any public confidence in the agencies established to administer the national labor policy unless all persons stand equally before the law and the administrative agencies with full and equal rights to fair hearings and impartial decisions."

MINIMUM STEEL WAGES AGAIN ENJOINED

The court of appeals of the District of Columbia last week granted a temporary injunction against Secretary of Labor Perkins' putting into force minimum wages in the steel industry until after the court has reached a decision on an appeal. Argument on the appeal will be heard April 3.

Appeal and application for a temporary injunction were filed by seven small eastern steel manufacturers who originally took the case into court. The entire steel industry was affected by the court's granting of the temporary injunction and the labor department's minimum wages will not become effective until the court renders its decision in the appeal.

This case originated in the district court for the District of Columbia when the seven companies asked for a restraining order. Justice Jennings Bailey of the district court granted a temporary injunction, but on argument refused to make it permanent. Counsel for the steel companies then appealed to the United States court of appeals. This is the first time enforcement of the Walsh-Healey law has been taken into the courts.

EARLY ADJOURNMENT OF CONGRESS PREDICTED

Seasonal predictions are being made for an early adjournment of congress. Following a conference with congressional leaders last week before the President left for his vacation, there was a definite intimation he had asked all but essential legislation be sidetracked so that congress could adjourn for economic purposes.

While no official statement was made, it was reliably reported the President asked legislative leaders to block revision of the national labor relations act, that there be no further slum-clearance legislation, and that the revision of the corporate tax laws be averted.

The President is reported also to have asked for the continuance of the nuisance taxes which amount to about $750,000,000 a year and that congress abandon the 50 per cent increase in social security taxes.

WAR DEPARTMENT OPPOSES WAR PROFITS TAX BILL

War department will oppose any drastic tax measure to take the profit out of war, it was reported last week. A bill along these lines has been introduced in the senate and endorsed by 50 members.

Such a proposal, according to war department officials, conflicts with the army's own industrial mobilization plans, to be put into effect immediately in the event of war. While the war department officials refuse to be quoted on the subject before

a formal expression from the secretary, it was argued the proposed taxes will practically be confiscatory.

PROPOSE INVESTIGATION OF MACHINES AND JOBS

A joint resolution to investigate the displacement of labor by machinery has been introduced in the house by Representative Faddis, Pennsylvania.

Resolution provides for the appointment of a committee on technological unemployment by the President and to consist of a representative of the AFL, CIO, department of labor, department of commerce and two representatives of the United States chamber of commerce.

The committee is to investigate the effects of recent technological changes in the manufacturing, mining, transportation, and distribution industries, upon the employment of labor and the possibility of further technological changes in these industries. In preparation for such an investigation and public hearings by the committee, the resolution provides the labor department shall prepare and analyze such data bearing on the displacement of labor by machinery and other technological changes.

An appropriation of $200,000 is provided, of which $150,000 shall be available to the labor department for its work, with the remaining $50,000 to go to the committee. The resolution provides that the committee shall report its findings to congress on or before June 1 of next year.

ICC REPORTS TO CONGRESS ON PENDING RAILWAY BILLS

Interstate commerce commission last week sent a communication to congress on various pending railroad bills.

A portion of the report dealt with railroad equipment. The committee of three commission members proposed $300,000,000 be made available for loans to finance shop and rolling equipment purchases.

Committee further recommended that for a period of 12 months or so the present requirement of law be suspended to the effect that before the RFC may make loans to railroads for certain purposes the commission must certify: "That such railroad, on the basis of present and prospective earnings, may reasonably be expected to meet its fixed charges without reduction thereof through judicial reorganization." It suggested the commission be required only to certify: "That the prospective earning power of the applicant together with the character and value of the security offered, furnish, in the opinion of the commission, reasonable assurance of the applicant's ability to repay the loan within the time fixed therefor, and reasonable protection to the United States."

The committee of six, representing railroad management and railway labor, recommended: "The RFC be empowered to make loans for railroad maintenance of way, structures, and equipment, provided the borrower agrees to use the proceeds for the direct employment of labor or the purchase of materials." This committee also recommended the RFC "be authorized to make loans for the construction or acquisition of railroad equipment up to the full cost thereof on the security of trust certificates on the equipment so acquired."

RECOMMENDS PENALTIES FOR WALSH-HEALEY VIOLATIONS

House last week passed the labor department appropriation bill carrying a provision for the hours and wages division for the coming fiscal year of $3,350,000. Bill also includes $322,120 for the public contracts board, an increase of $22,120 over the current appropriation.

In connection with the public contracts board which administers the Walsh-Healey act, the house committee in approving the appropriation called attention to the fact that the Walsh-Healey law makes no provision for a penalty to be imposed on those violating its provisions, except denying the right of the violator to bid on subsequent government contracts.

"The only accountability," said the committee, "that can be demanded of a contractor subject to the operations of the act is to comply with the terms of the agreement. Obviously merely to require a person to do what he already has contracted to do is in nowise a deterrent and it is much to be hoped that the committee on labor of the house will give appropriate consideration to this problem during the pending session of congress."

GOVERNMENT IRON, STEEL AWARDS TOTAL $356,355

During the week ended March 25, the government purchased $356,354.61 worth of iron, steel and their products under the Walsh-Healey act: Heppenstall Co., Pittsburgh, $11,873.90; Nathan Straus-Duparquet Inc., New York, $9,578.40 (estimated); Atlantic Metal Products Inc., Long Island City, N. Y., $11,726; Sneed & Co., New York, $17,960; Carnegie-Illinois Steel Corp., Washington, $66,480 (estimated); Ross Galvanizing Works Inc., Brooklyn, N. Y., $12,885.69 (estimated); Jones & Laughlin Steel Corp., Pittsburgh, $10,545 (estimated); United States Steel Products Co., Washington, $41,310.42; Inland Steel Co., Chicago, $83,782.25; Bethlehem Steel Co., San Francisco, $12,135.50; Rustless Iron & Steel Corp., Baltimore, $17,005.45; National Malleable & Steel Castings Co., Cleveland, $61,072.

"FOREIGN TRADE WEEK" IS SET FOR MAY 21-27

Chamber of commerce of the United States has designated May 21-27 for the observance of "National Foreign Trade Week" and is organizing appropriate meetings throughout that period. Initiated in 1935 when 600 groups participated, the movement has grown steadily and in 1938 over 1200 groups took part.

Object of the movement is: (1) To direct attention to the foreign trade of the United States, its national importance, and its relationship to domestic industry and trade; and (2) to stimulate local survey and development of foreign trade possibilities in individual cities and towns and in individual industries and trade.

E. L. Bacher, manager of the chamber's foreign commerce department, Washington, is directing plans for the event.

SHARP DEMAND IN CHILE FOR IRON, STEEL PRODUCTS

Demand in Chile for iron and steel products, principally black sheets to be galvanized for roofing, and skelp for manufacture of pipe has increased sharply since the earthquake in January, according to a report to the department of commerce.

The United States would normally supply the bulk of such demand since American products are favored because of quality and quick delivery. Owing to the recent acute shortage of dollar exchange, however, the Exchange Control commission finds it necessary to curtail imports of even essential commodities from the United States, thus diverting purchases to countries which have exchange available, the report stated.

It is understood that 1400 tons of corrugated galvanized sheets have been purchased from Argentina with money donated by that country to the earthquake relief funds. Two local galvanizing plants, one in Santiago and one in Valparaiso, are reported to have arranged to obtain 4000 tons of black sheets from Belgium in return for a barter of barley.

■ United States Steel Corp. common stockholders of record March 4 numbered 167,750, a decrease of 1472 since Nov. 30. Preferred stockholders of record Feb. 3, totaled 66,714, an increase of 411 since Oct. 28.

AVIATION

AIR CORPS TO PLACE ORDERS TOTALING $50,000,000

■ INITIAL orders in the air corps' authorized expansion program will be released in amount of $50,000,000 following President Roosevelt's approval of the war department appropriation bill, it is disclosed by procurement officers. Probable total of awards during 1939 is estimated at 1000 military planes.

Bids are called at Wright field, Dayton, O., as follows: July 5, two and four-engined bombers; July 6, advanced training planes; July 7, basic and primary trainers; July 8, interceptor pursuit, multi-place fighters and observation ships.

French air ministry last week contracted for an additional 100 fighting craft, increasing its current American bookings to 715 planes. It is indicated Glenn L. Martin Co. received the award, reportedly for light bombers.

France also ordered 200 engines valued at $2,800,000 from Pratt & Whitney division of United Aircraft Corp., East Hartford, Conn. This increases its engine awards here to 1000, at total cost of about $14,000,000. Option is held for an additional 200 motors. United Airlines has placed an order with Pratt & Whitney for 30 Wasp 1000-horsepower engines.

Aeronautical equipment just ordered: For the army, Fairchild Aerial Camera Corp., Jamaica, L. I., computer assemblies, $55,104; and for navy, Hamilton Standard propeller division of United Aircraft Corp., East Hartford, Conn., propellers, $16,311; and Worthington Pump & Machinery Co., Harrison, N. J., pumps, $145,878.

The navy last week awarded a $1,516,357 contract for airplanes and parts to El Segundo division, Douglas Aircraft Co., El Segundo, Calif.

Newport News Shipbuilding & Drydock Co., Newport News, Va., has booked a $31,800,000 navy award for constructing aircraft carrier HORNET. Taking 13,000 tons of steel, the ship will require 34 months to build, and is to have a complement of 108 planes.

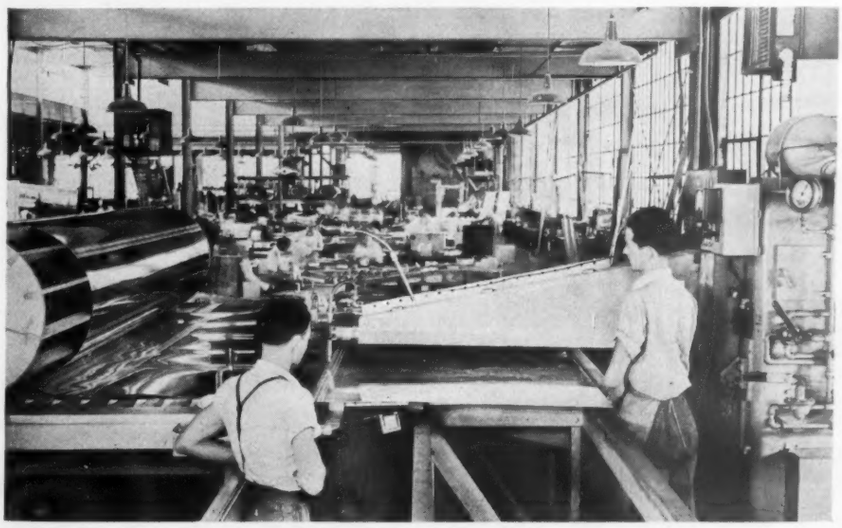
United Aircraft Corp. will soon let contracts for building a $300,000 addition to the Stratford, Conn., plant of its Chance Vought and Sikorsky airplane divisions. Architect is Albert Kahn Inc., Detroit.

Solar Aircraft Co., San Diego, Calif., is preparing to erect a $35,000, 170 x 180-foot factory unit, and will purchase machinery costing another $30,000.

Recent declarations regarding necessity for greater aeronautical research are resulting in considerable expansion of testing and development facilities. Navy department will build a $1,800,000 engineering laboratory at its Philadelphia aircraft factory, installing motors, regulators, conveyors and other equipment.

Reporting on its recent airport survey, civil aeronautics authority has recommended congress appropriate $128,000,000 during the next year to improve the nation's airfields with additional hangars, lighting facilities and runways.

Welding Aluminum Alloy Sheets for Wing Covering



■ **Surfaces for Clipper plane wings are formed in Boeing Aircraft Co.'s Seattle plant by seaming together small alclad aluminum alloy sheets with an electric spot-welder into long sheets, which are coiled as shown above. Clipper wings measure 152 feet from tip to tip**

Activities of Steel Users, Makers

■ AN ORDER permitting disposal of certain assets of Burden Iron Co., Troy, N. Y., under direction of Walter W. Weismann, president, Aetna Industrial Corp., New York, has been issued in federal court. An inventory will be cataloged and it is expected the assets will be sold privately within 30 to 60 days. Negotiations looking toward the continuation of the horseshoe business, conducted under direction of Joseph W. Burden, have been practically completed.

♦

Negotiations whereby American Brake Shoe & Foundry Co., New York, will acquire Kellogg Compressor & Mfg. Co., Rochester, N. Y., are under way and final details are expected to be closed within the next few days, according to David W. Schelter, treasurer and controller of Kellogg. This company makes air compressors used at gasoline stations.

♦

District representatives, sales executives, and engineers of the stoker division, Link-Belt Co., recently held their annual sales and engineering conference in Chicago. In the opinion of the group, 1939 will again show an increase in stoker sales.

♦

Jones & Laughlin Steel Corp. has moved its Chicago district sales office to the tower of the Bankers building, Clark and Adams streets. Samuel A. Fuller is district sales manager.

♦

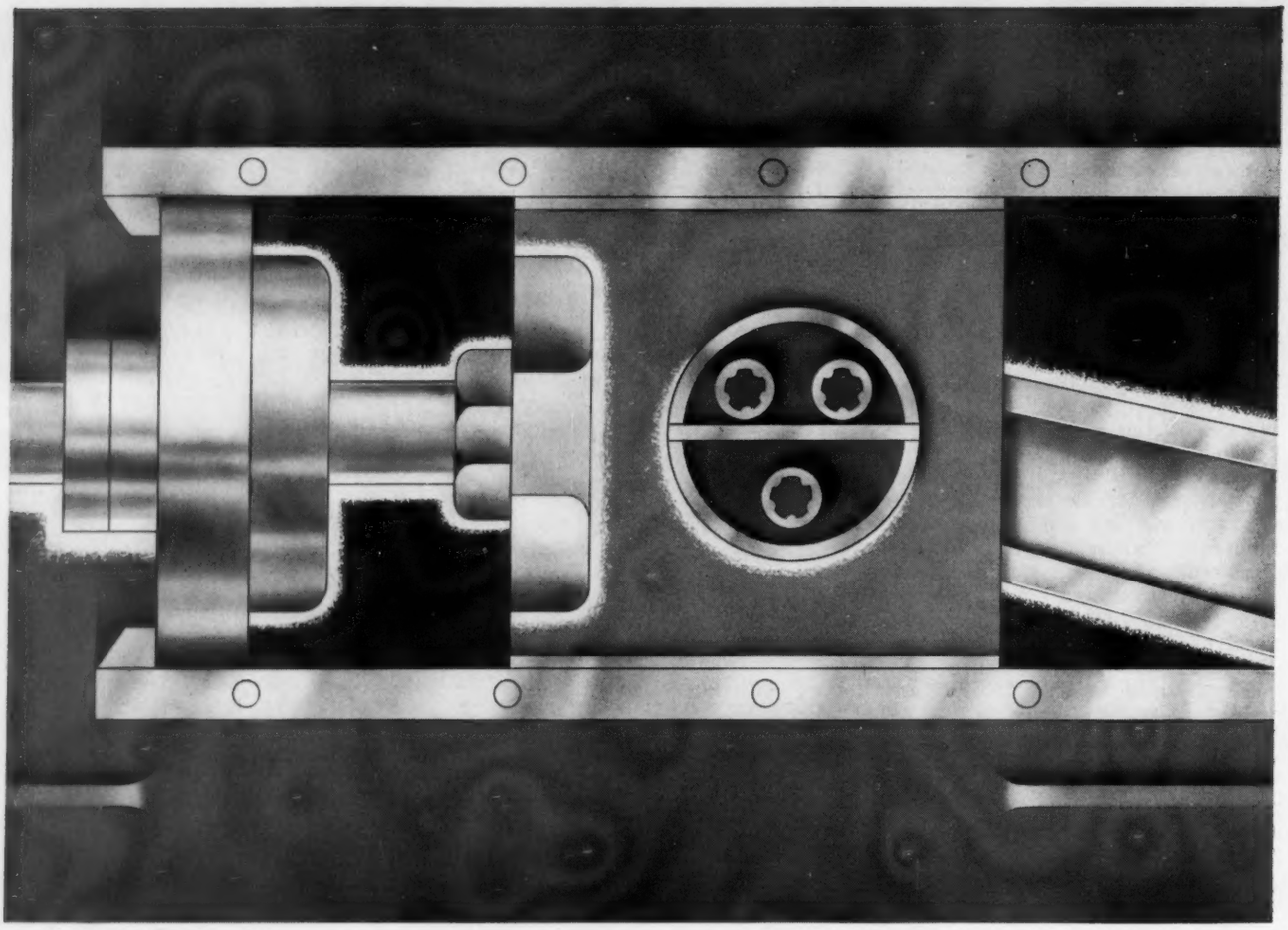
Meehanite Metal Corp., Pittsburgh, has granted the right to manufacture Meehanite metal to Lowes Foundry Co., Lower Hutt, New Zealand, and Booth-MacDonald & Co. Ltd., Christ-Church, Australia.

♦

Taft-Peirce Mfg. Co., Woonsocket, R. I., and its Detroit representative, John E. Livingstone Co., have moved back to their former Detroit address at 2921 East Grant boulevard. J. B. Rousseau, Taft-Peirce Detroit district sales manager, will make his headquarters at the same address.

♦

Sauereisen-Fuchs & Co., Fulton building, Pittsburgh, has been organized to manufacture and market industrial ceramic and cement products. Among these is the Sauereisen patented brick for use in pickling tanks or wherever acid-proof lining or flooring is required. C. Fred Sauereisen, of Sauereisen Cements Co., is president of the new company. G. A. Fuchs, formerly of Harbison-Walker Refractories, is vice president and general manager.



MAKING PRODUCTION DOLLARS S-T-R-E-T-C-H

The simplification or elimination of fabricating processes is one way of making production dollars go farther. Molybdenum steels are often a help in that way.

For instance, a manufacturer of high pressure motor driven pumps uses cast Nickel-Molybdenum steel for cross-head guides because it has the required toughness and hardness. In addition, the ready machinability and close grained structure of the steel make it possible to produce a good bearing surface in the guide runways by a light cut with a shearing tool. One finishing operation — grinding — is entirely eliminated.

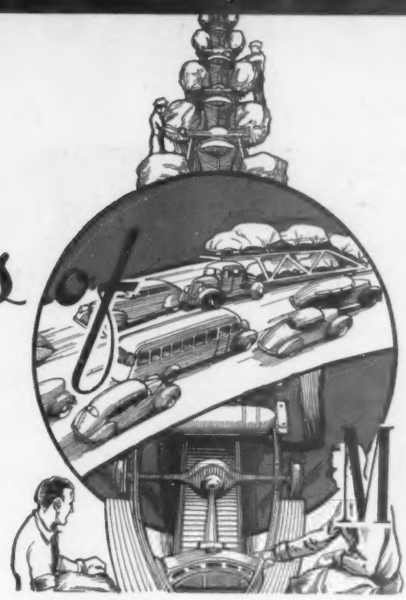
Rechecking your own material specifications may reveal places where Molybdenum steels will produce better results, or lower costs, or both. Our technical book, "Molybdenum in Steel," will be sent free to any interested production executive or engineer who requests it.

PRODUCERS OF FERRO-MOLYBDENUM, CALCIUM MOLYBDATE AND MOLYBDENUM TRIOXIDE

Climax Mo-lyb-den-um Company
500 Fifth Avenue · New York City

MOLY

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

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DETROIT

■ ONE characteristic of next year's models which now are in the preparatory stage will be a definite trend toward wider and longer hood tops patterned after a design which perhaps can best be explained by the three words, "down in front." By next year the change to the alligator-type hood, hinged at the front or back, will be practically universal and the day of the double hood, hinged along the center line, will be over. The new designs are less expensive, give access to both sides of the engine with a single lifting, and are more adaptable to the streamlined front-end designs.

Hood top widths are being stepped up, incidentally. Buick, for example, requires a steel sheet 88 inches wide and 84 inches long, or more than 7 feet square. While steel mills have no trouble in supplying any desired length in this type of sheet, there are only a few mills equipped to turn out a width of 88 inches.

To Require Deeper Drawing

The new hood tops, instead of terminating at the belt line, will sweep down the nose half way or more to the axle line, which means that in some of these new designs an appreciable amount of draw has to be given the sheet, whereas in past years these tops went little beyond a blanking operation or at the most only a slight dishing.

Continuing the hood top down the front of the car will mean disappearance of center radiator grilles and cooling air will have to be handled by catwalk grilles plus whatever louvering is necessary in the front assembly. The 1940 Nash, for example, will show a completely reworked front end with larger catwalk grilles comprising vertical bright metal bars capped by a catwalk which appears to roll out of the top of the grille. Center grille has been dispensed with altogether; headlamps continue in front fenders.

Those who have seen the new design say it is even more attractive than the present Nash lines which are rated near the top in the industry by impartial critics. Body lines for 1940 are changed only slightly from this year which is to be expected in view of the fact Nash spent over $2,500,000 on tooling up for 1939 models.

Work is proceeding on the small Nash line which probably will be introduced this fall along with the larger models, thereby giving Nash dealers a more complete coverage of the low and intermediate price fields.

In company with hood tops, front fenders of 1940 models also will be required to take deeper draws to conform to designers' conceptions. On this year's models it was believed the limits of deep drawing had just about been reached on front

Diesel Truck Carries 35-Ton Load

■ **International Nickel Co. uses six huge Mack trucks at its open pit Frood mine, Copper Cliffs, Ont. Powered with a Cummins diesel developing 150 horsepower at 1800 revolutions per minute, each of these new triple-axle trucks has a capacity of 35 tons or 21 cubic yards, weighs 57 tons loaded, has ten forward speeds, two reverse, uses more than a ton of alloy steel with nickel content ranging from 3 to 4½ per cent. Two hydraulic cylinders, each with a 4-unit telescoping section, dump the body. Bucyrus-Erie shovel with 4½-cubic yard dipper weighs 165 tons, employs more than 16 tons of nickel alloy steels**

fenders, but present indications are that they will be carried a step further next year. The deeper the draw becomes on fenders, the more difficult is the tooling problem and the greater the possibility of encountering an objectionable number of defective pieces in process. To circumvent these problems, manufacturing experts are turning to the idea of making fenders in two separate pieces and then welding them together.

There are two ways in which this can be done. Either the piece can be split longitudinally or across the nose. Since it is the nose of the fender which usually must take the deepest draw, and since fender noses have been further complicated by incorporating headlamps in them it is occasionally preferred to stamp the nose separately and then weld it to the rest of the fender. In this way the difficulty of withdrawing a press punch after the severe draw in a one-piece fender is overcome, die designs are simplified and rejects are held within their normal limits of 2 to 5 per cent.

Eventually it is hoped to be able to make the front end of a car in three pieces—two fender stampings and the catwalk and radiator shell stamping. However, with present designs this is virtually impossible, so various compromises must be made.

■ TORTUOUS path leading toward introduction of the Hupmobile Skylark models has been far from traversed as yet, but another step was taken last week with awarding of contract for 1000 frames reportedly to Truscon Steel Co. Fenders will be supplied by Hayes Body Co. Inquiries for a wide range of other parts have been issued on the basis of deliveries starting early this month, but for a large number of dies and tools, work must be started from scratch. Conceding the utmost speed in completion of such dies, it is hard to see how many cars can be completed much before July 1.

Meanwhile the company is cleaning up some inventories of stocks in its senior line and has placed attractive prices on much of this merchandise. Assemblies in the senior models are running around 100 per week.

Arrangements have been made for a loan of $250,000 to Graham, under supervision of the RFC, to permit manufacture of an additional lot of 1000 cars. Production, on a five-day week basis, runs around 140 cars. In the first three months of this year, Graham assembled about 1500 jobs. Seasonal improvement in tractor buying should aid Graham in moving stocks of tractors built during the winter season, and this plus the hope for improved retail sales of cars in the next three months, should assist this producer in returning to a profitable basis of operations.

■ EXPERIMENTAL work being conducted by an Ohio steel company may lead to the commercial introduction of a new type of aluminum-coated flat-rolled steel material which can compete with such products as terne plate on a price basis.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1937	1938	1939
Jan.	399,186	227,130	353,946
Feb.	383,900	202,589	321,141
March	519,022	238,598	.....
April	553,231	238,133	.....
May	540,377	210,183	.....
June	521,153	189,399	.....
July	456,909	150,444	.....
Aug.	405,072	96,936	.....
Sept.	175,630	89,623	.....
Oct.	337,979	215,296	.....
Nov.	376,629	390,350	.....
Dec.	347,349	407,016	.....
Year	5,016,437	2,655,777	.....

Estimated by *Ward's Reports*

Week ended:	1939	1938†
March 4	78,705	54,440
March 11	84,095	57,438
March 18	86,725	57,555
March 25	89,400	56,800
April 1	85,980	57,500

†Comparable week.

	Week Ended	
	April 1	Mar. 25
General Motors	33,260	35,230
Chrysler	20,375	20,825
Ford	22,230	22,350
All others	10,115	10,995

A fair tonnage of terne plate goes into gasoline tanks for the motor industry, and there is a constant search being made for a less expensive and perhaps improved type of flat-rolled steel with corrosion-proof coating which can be subjected to forming operations without harm to the coating.

Another steel company has been experimenting for some time with sheets and strip having an electroplated zinc coating instead of the customary hot-dip galvanized coating. While good reports are heard of these tests, no commercial introduction of such a material has been made.

The recent suggestion that steel can be given an integral coating of stainless-type alloy at a price commensurate with galvanized and terne plate has stimulated interest in the subject of coatings, and some important developments are foreshadowed in this field. Crown Cork & Seal Co., Baltimore, for several years has been making an aluminum-coated strip steel, but not much is known of this product. The new aluminum development, said to be under the aegis of the Aluminum Co. of America in co-operation with a steel producer, should bear watching.

■ PRESENCE of a number of men formerly associated with Chrysler Corp. in the personnel of the Willys-Overland organization at Toledo, O., naturally led to reports concerning the possibility Chrysler was moving toward control of Willys operations. This was vehemently denied by the Chrysler management, and in the cold light of analysis it is difficult to determine any sound reason why Chrysler should be interested in acquiring Willys properties. Any immediate expansion of Chrysler probably would be concentrated near present Detroit plants or in Indiana.

Later investigation has suggested another probability concerning the personnel shifts. It is related on good authority that some of these Toledoans were anticipating a rather thorough reshuffling of Chrysler personnel, and, reading the handwriting on the wall, set out to acquire a new outlet for their talents. As yet, other than these transfers to Toledo, there have been no major upheavals in Chrysler executive personnel, but in trade circles here word is being passed around of an imminent shakeup.

■ HUDSON has announced quietly a new series of 1939 models to be known as the Pacemaker six line. They are on 118-inch wheelbase, powered with 96-horsepower motors, and fitted into a price class between the Hudson 112 and the deluxe six. The new series is available in four body types ranging in price from $793 to $854, delivered Detroit, about $50 under the level of the deluxe six.

Chrysler has extended its contract with UAW until April 22, to permit the union to settle differences within its ranks. Meanwhile the corporation is taking the position that it cannot bargain with any one faction of the union without representatives of other factions being present. This pretty well stymies any dealings with the UAW in its present dismembered state. The attitude is fairly general throughout the automotive industry, and throws the weight of responsibility on the shoulders of leaders of opposing factions in the union who themselves are in a quandry until court action can determine the rights of various officers and acting officers, as well as unlocking an impounded treasury.

Try this "quiz," then send for the books you need

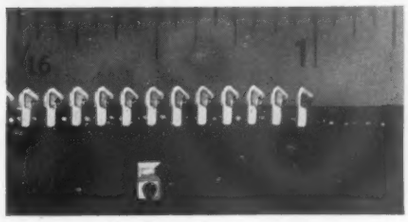
1 **Q How will ZINC Alloy Die Castings stand up under shock loads?**

A Every time this stamping ring is used it is struck with a hammer—dating the sale of storage batteries. Yet, as a ZINC Alloy Die Casting, it can withstand this shock punishment over a long period of time. Impact strength is just one of the physical properties covered in the Research Bulletin "*Zamak Alloys for ZINC Alloy Die Castings.*"

2 **Q What can be expected in the way of service from plated coatings on die cast parts?**

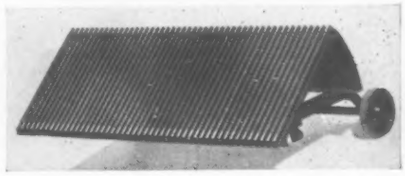
A When a plated coating of sufficient thickness is properly applied to a ZINC Alloy Die Casting it will adhere and remain lustrous for the normal service life of most parts used indoors. The mixing machine shown above—conceived by Fred Waring, the well-known orchestra leader—takes considerable abuse in service. The die cast base is chromium plated, and not one complaint on finish has been received since the machine was first placed on the market. See "*The Finishing of ZINC Alloy Die Castings and Rolled Zinc.*"

3 **Q What is the size range of ZINC Alloy Die Castings?**



A An automobile windshield frame weighing 33 pounds and measuring 50" x 22" was successfully die cast in ZINC Alloy. At the other end of the range we find a tiny slide fastener element. This die casting weighs .022 gram—20,640 castings to the pound. "*The Alloy Pot*"—a periodical—keeps its readers informed on all die casting developments such as these.

4 **Q Has the scope of die casting applications been widened in the last few years?**



A Those engineers who think of ZINC Alloy Die Castings in terms of simple, decorative parts only, will do well to investigate the "tough application" trend in this industry. For example, who would have considered die casting an escalator tread a few short years ago? The one shown here is doing an excellent job of resisting abrasion. Die casting applications in four different industries are pictured in the four booklets "*Zinc Alloy Die Castings in Business Machines—In Electrical Equipment—In Hardware—In Industrial Equipment.*"

Any or all of the booklets indicated above will be sent on receipt of a request on a Company letterhead . . . Also, we will be pleased to place your name on "The Alloy Pot" mailing list . . . If you have any specific questions on the subject of ZINC Alloy Die Castings we suggest that you consult a commercial die caster—or, our Technical Service staff is at your disposal. The New Jersey Zinc Company, 160 Front Street, New York City, New York.

ZINC ALLOY DIE CASTINGS

The Research was done, the Alloys were developed, and most Die Castings are specified with

HORSE HEAD SPECIAL (99.99+% Uniform Quality) ZINC

February Imports Off 27 Per Cent

■ FEBRUARY imports of steel and iron products, excluding scrap, totaled 17,736 gross tons valued at $1,236,673. These figures represent a decline of 6595 tons, or 27 per cent, in volume, and $492,472, or 28 per cent, in value, from January. Comparable figures for February, 1938, are 19,589 tons, valued at $1,414,688.

As reported by the metals and minerals division, department of commerce, ferromanganese was the largest item, 2889 tons, imported in February. This included 1301 tons from Norway and 1264 tons from Czechoslovakia. Belgium was the chief source of imports, its total of 5296 tons including 1850 tons of structural shapes, 1197 tons of hoops and bands and 802 tons of bars. German shipments totaled 3632 tons, including 1043 tons of pipe and 1034 tons of barbed wire. Canada's total was 2267 tons.

Scrap imports, 1413 tons, were less than half as large as in January —3333 tons—but had a much greater value per unit, as indicated by total of $22,568, compared with $30,707 in January. Less than one ton of scrap, valued at $4, was imported in February, 1938. Canada shipped 1393 tons in February; and Sweden, 20.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1939		1938	
	Exports	Imports	Exports	Imports
Jan.	362,672	27,664	586,294	29,631
Feb.	359,690	19,149	460,640	19,589
March	.....	.....	526,883	11,827
April	.....	.....	489,202	21,237
May	.....	.....	540,639	20,814
June	.....	.....	312,021	15,887
July	.....	.....	263,699	14,728
Aug.	.....	.....	242,139	20,041
Sept.	.....	.....	346,068	27,958
Oct.	.....	.....	425,431	26,445
Nov.	.....	.....	469,596	27,627
Dec.	.....	.....	490,095	28,767
Total	.....	.....	5,152,707	264,551

ORIGIN OF FEBRUARY IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferromanganese
Norway	7,038	.....	.....	1,301
Sweden	7,157	.....	.....	.....
France	.....	.....	5	63
Canada	60	105	.....	.....
Cuba	21,000	.....	5,572	.....
Chile	130,500	.....	.....	.....
Australia	13,016	.....	.....	.....
Netherlands	.....	99	.....	.....
British India	.....	399	1,591	.....
Soviet Russia	.....	.....	6,208	.....
South Africa	.....	.....	9	.....
Gold Coast	.....	.....	9,353	.....
Czechoslovakia	.....	.....	.....	1,264
Poland	.....	.....	.....	21
Yugoslavia	.....	.....	.....	240
Brazil	.....	.....	3,351	.....
Total	178,771	603	26,089	2,889

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
Belgium	20	1,850	802	1,197
France	57	463	238	212
United Kingdom	4	.....	32	.....
Germany	.....	99	154	238
Sweden	15	.....	155	23
Czechoslovakia	.....	.....	4	.....
Total	96	2,412	1,385	1,670

U. S. IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Feb. 1939	Jan. 1939	Jan. thru Feb. '39
Pig iron	603	586	1,189
Sponge iron	266	34	300
Ferromanganese (1)	2,889	3,150	6,039
Spiegeleisen	2,033	976	3,009
Ferrochrome (2)	.....	.....	.....
Ferrosilicon (3)	273	74	347
Other ferroalloys (4)	7	25	32
Steel ingots, blooms	.....	1	1
Billets	7	7	14
Concrete reinforc. bars	162	365	527
Hollow bar, drill steel	63	100	163
Bars, solid or hollow	1,385	2,188	3,573
Iron slabs	.....	.....	.....
Iron bars	79	50	129
Wire rods	711	1,196	1,907
Boiler and other plate	.....	.....	.....
Sheets, skelp, saw plate	96	171	267
Die blocks or blanks	2	.....	2
Tin plate, taggers' tin and terne plate	12	3	15
Structural shapes	2,412	3,534	5,946
Sashes and frames	5	.....	5
Sheet piling	.....	.....	.....
Rails and fastenings	146	241	387
Cast iron pipe and fitgs.	100	32	132
Malleable iron pipe fitgs.	15	.....	15
Welded pipe	217	270	487
Other pipe	1,137	6,550	7,687
Cotton ties	.....	2	2
Other hoops and bands	1,670	1,894	3,564
Barbed wire	1,654	1,012	2,666
R'nd iron and steel wire	282	285	567
Telegraph, telephone wire	.....	1	1
Flat wire and steel strips	166	270	436
Wire rope and strand	134	240	374
Other wire	251	240	491
Nails, tacks and staples	796	553	1,349
Bolts, nuts and rivets	6	12	18
Horse and mule shoes	63	45	108
Castings and forgings	94	224	318
Total (gross tons)	17,736	24,331	42,067
Iron and steel scrap	1,413	3,333	4,746
GRAND TOTAL	19,149	27,664	46,813

(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content.

Machinery Exports Down 12 Per Cent in February

■ February industrial machinery exports, valued at $20,752,939, were 12 per cent lower than in February, 1938, at $23,631,271, according to the machinery division, department of commerce. Losses were noted in all major groups except mining, well and pumping equipment.

Power-driven metalworking equipment exports were valued at $7,832,893, compared with $9,459,830 a year ago, a decline of 17 per cent. Shrinkage was fairly uniform in all classes, except for slight increases in vertical boring mills and chucking machines, milling machines, planers and shapers and machinery for forging.

Power generating equipment, except electric and automotive, dropped 35 per cent, from $1,359,301 a year ago to $876,963 in February. Construction and conveying equipment lost only 4 per cent from last year. Mining, well and pumping equipment gained 7 per cent, from $4,674,442 to $4,985,230. Textile, sewing and shoe machinery declined 2.5 per cent.

MEETINGS

REINFORCING STEEL GROUP ARRANGES PROGRAM

■ PROGRAM for the fifteenth annual meeting of the Concrete Reinforcing Steel institute at the Forest Hills hotel, Augusta, Ga., April 20-21, will feature an address, "Future Needs for Construction," by A. H. Temple, National City bank, New York. A. E. Lindau, chairman of the institute's committee on engineering practice, will review the research program under way at Lehigh university.

J. Ralph Fenstermaker will outline the advertising and promotion campaign for the current year. New officers will be elected. The annual golf tournament will be held April 21.

ELECTRICAL ENGINEERS PLAN CONVENTION IN HOUSTON

American Institute of Electrical Engineers will conduct a Southwest district meeting and student branch convention at Rice hotel, Houston, Tex., April 17-19. One feature will be a symposium on electricity in pipe line corrosion. H. H. Henline, 33 West Thirty-ninth street, New York, is institute secretary.

Offer Process To Make Standard Concrete Shapes

■ Mass production methods with resulting lower cost and standardization in sizes and quality will be made available to concrete shape manufacturers through a process owned by the newly-organized Cemenstone Corp., Pittsburgh.

The company will not manufacture precast concrete products but will supply its patented equipment to licensees in designated areas who will make products according to the corporation's standards.

Cemenstone's process is said to be similar to methods employed in a steel plant in its mass production ability, and adaptability to produce many shapes and sizes. Molds are interchangeable.

Equipment consists of a rigid steel frame over a curing chamber which produces a temperature of 160 degrees Fahr. A hopper, which fills the molds with concrete mixed to a plastic state, rides on top of the frame, with vibrators which agitate the mix. After hardening, the shapes may be removed easily and stored for curing. The short-span slabs are

reinforced with ¾-inch rods welded to metal fabric mesh to form a truss.

Chairman of the new corporation is W. P. Witherow, founder of Witherow Steel Corp. and president, Blaw-Knox Co. Leslie M. Johnson, former vice president and general manager, A. M. Byers Co., is president, and Albert Henderson, who developed the process, is consulting engineer.

Develops Molybdic Oxide Briquets for Alloying

■ Climax Molybdenum Co., Langeloth, Pa., has announced a molybdic oxide briquet for alloying iron and steel. Briquets are 5-pound cylinders, 3½ x 4½ inches, composed of a mixture of technical molybdenum trioxide and a sulphur-free pitch binder. Each contains 2½ pounds molybdenum.

The briquets were developed primarily to provide an economical and convenient means of making additions of molybdenum to cast iron in the cupola, electric furnace or air furnace. They also are said to provide advantages as a means of adding molybdenum to steel.

Proportions of molybdenum and carbon are such that the briquets are self reducing. At the temperature of molten iron or steel, molybdenum trioxide is reduced by the carbon, first to one of the suboxides of molybdenum, and then progressively through the lower oxides of metallic molybdenum, which are absorbed by the metal in the bath. Carbon dioxide passes off as a gas. There is said to be no carbon pickup by the metal in the bath.

Briquets also are intended for direct addition to the cupola or furnace charge; they are not suitable for making ladle additions. When electric or air furnaces are used, briquets can be added either to the cold charge or when the bath is molten. They also can be added either to cold charges of steel or to the molten bath.

Seek Methods To Increase Sales Of Gas Fuel in Industrial Field

■ MEANS by which industry, metalworking plants in particular, can utilize gas more extensively in its heating operations, were considered by public utility representatives and equipment manufacturers March 27-28 at Hotel Statler, Cleveland. This annual sales conference of the industrial gas section, American Gas association, was attended by more than 160 executives, engineers and salesmen.

Some idea of the importance of industry as a user of gas is gained from a study of estimated sales figures for 1938. Residential consumption was 598,638,000,000 cubic feet, while 964,160,000,000 cubic feet went to nonresidential use. Thus the latter, which includes industrial consumption, represents 61.6 per cent of the total. Sales on a dollar basis amounted to $536,990,000 for residential uses, and $249,586,000 for nonresidential uses, the latter representing only 31.8 per cent of the total. This is explained by lower rates for commercial and industrial applications.

The figures include both natural and manufactured gas.

Urges Articulate Business

Discussing economic conditions at a luncheon on the first day, W. E. Whipp, president, Monarch Machine Tool Co., Sidney, O., and president, National Machine Tool Builders' association, asserted that business men are not sufficiently articulate, being prone to "take it on the chin," either because of indifference, diffidence, concentration in their own affairs, or fear.

Many problems must be solved, he said, first and foremost being unemployment, the result, not of the machine, but of a disturbed world and a disordered economy. Machinery and industry cannot effect a solution alone, Mr. Whipp continued. Only as productive enterprise is permitted to survive and prosper unhampered by confiscatory taxes, throttling governmental regulation and activities of theorists and pressure groups; only as science and invention are permitted to open new fields for enterprise; only as new products and new uses for old products are developed, can we take up our share of surplus manpower and contribute to progress.

The course of action, he pointed out, is: (1) To forget panaceas, either political or economic, and proceed on sound principles; (2) to build a defense against subversive attacks; and (3) to determine whether the approach to sales is shaped to result in real service to prospects and to the world.

A number of papers and addresses dealt with new applications for gas, more efficient utilization of the fuel, rates, and sales methods. On the second day, panel discussions were devoted to ferrous metals, nonferrous metals, ceramics, food industries, and industrial and commercial air conditioning.

Among the new and expanding uses for gas is that of supplying fuel for immersion tube boilers and water heaters, a development of the past eight years, according to O. N. Sellers, Sellers Engineering Co., Chicago. In these units, gas is burned in tubes which are surrounded with water. Today, immersion boilers and water heaters are at least 80 per cent efficient. Mud and lime settles below all heating surface in the form of a silt and is removed easily from the units by blowing or draining from the bottom. By dropping the lime and mud below all heating surface the relative efficiency of the boiler re-

(*Please turn to Page* 59)

■ Sales of industrial gas were discussed by this group meeting in Cleveland last week

Editorial

Businessmen Should Encourage Reform

■ WHAT does the average metalworking company think about the future? To obtain an answer to this question, STEEL has made a survey of 74 companies which represent a typical cross-section of American industry.

Of these 74 companies (see page 15), 51 said that they have plans for plant improvements. Total expenditures would come to $7,411,000. Of this, $1,217,500, or 16.4 per cent, is to be spent without delay. The remaining 83.6 per cent is held up because of "unfavorable government policies," "unfair labor law," "unsound tax system," "high taxes," "uncertainty over immediate outlook for business," "inability to borrow money."

This sample appears to indicate that the average American industrial company now has plans for spending close to $100,000 for plant improvements but that it is going to spend only $16,452 of this amount immediately.

Thus, business confidence is growing. It requires little conjecture to reach the conclusion that an exhibition of real government encouragement to business, in the form of more favorable laws and policies, is all that is required to raise the business level to one of prosperity.

Failure of Businessmen To Impress Congress Holds up Tax Reform

What is the likelihood that the present congress will give tangible evidence of a desire to encourage business? The answer is that the moves in this direction in the main are of a faltering character. Administration and congressional leaders who have definite remedial plans in mind are having difficulty in arousing enthusiasm for them.

It now is becoming evident that one of the real reasons for the hesitant attitude is that congress does not have a clear-cut impression that the recommended reforms really are desired by industry and would definitely have the effect of stimulating business.

This is the case with reference to taxes. It is not at all certain that the plan to eliminate taxes on undistributed earnings, capital stock and excess profits, and to remove minor irritants, will be pushed to a satisfactory conclusion. Prevailing opinion at Washington is that industry is only lukewarm on the proposed changes, for the reason that the elimination of these taxes would be accompanied by an increase in the tax rate so that total taxes would come to the same amount or a little higher.

Congress Must Be Educated as To What Makes Business Go

This impression, of course, is unfounded. But it reflects the fact that businessmen are failing to do the educational work that is required to bring about a general understanding as to what is necessary to stimulate business and enable it to put more people on its payrolls.

In his contribution to STEEL'S Forum on Re-employment (STEEL, March 27, page 38), Henry Buker, vice president, Brown & Sharpe Mfg. Co., Providence, R. I., mapped out a course of action by which industry can work its way out of its present difficulties. He points out that difficult conditions are not new to industry. He recommends good advertising and salesmanship: First, to educate congressmen and senators now in Washington to a more sane way of looking at their problems; second, to use their influence as far as possible in the future to see that only the right kind of men are elected to represent them.

STEEL believes with Mr. Buker that industry must follow this formula effectively if it is to contribute as it should toward its own future and that of the country.

The BUSINESS TREND

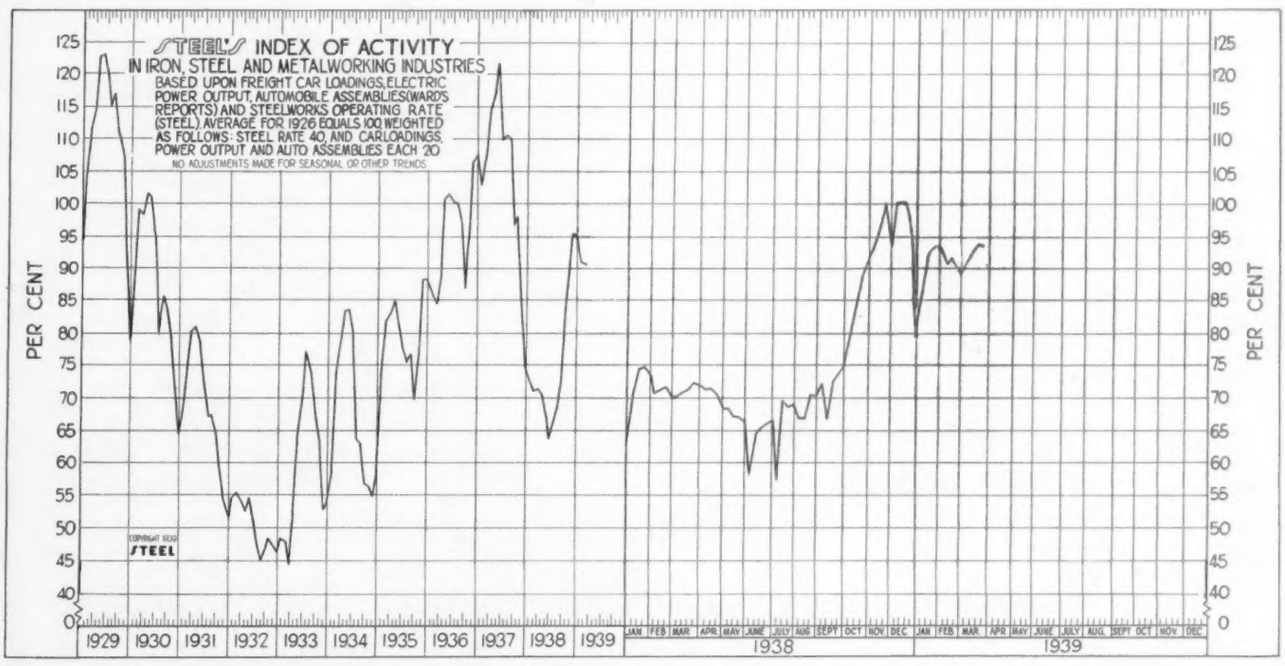
Activity Index Hovers Around Year's Peak

■ INDUSTRIAL activity remained substantially unchanged in the week ended March 25. STEEL's index of activity in the iron, steel and metalworking industries now stands at 93.2, compared with 93.3—the high point of 1939—recorded in the previous week. The current index number of 93.2 is substantially above the 72.4 established in the same week last year.

Automobile production during the week ended March 25 continued its steady seasonal advance. Output increased for the fourth consecutive week to 89,400 units. This compares with 86,725 in the preceding week and is approximately 57 per cent above the 56,800 units assembled in the same week last year. Since the low point this year during the week ended Feb. 25, assemblies have recorded an average weekly increase of 3435 units. Early estimate of the February sales of about 163,000 units would indicate an increase of approximately 36 per cent over those of last year. For the first ten days of March factory reports indicate a continuation of the general seasonal upward trend in sales.

Steelmaking operations during the week ended March 25 eased one point to 55.5 per cent, thus reverting to the level during the latter part of February. This recent decline also represents the first set-back in steelworks operations since the week ended Jan. 21. A year ago the national steel rate stood at 35.0 per cent.

Electric power consumption during the week ended


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL). AVERAGE FOR 1926 EQUALS 100. WEIGHTED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS
COPYRIGHT 1939 STEEL
PER CENT
125 120 115 110 105 100 95 90 85 80 75 70 65 60 55 50 45 40 0
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1938
1939

STEEL'S index of activity declined 0.1 point to 93.2 per cent in the week ended March 25:

Week ending	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Jan. 7	86.5	70.1	107.8	90.2	65.4	53.6	45.3	55.8	69.2	88.1	94.8
Jan. 14	91.9	74.4	106.7	89.3	73.8	58.1	48.6	56.2	72.1	91.8	104.2
Jan. 21	93.0	74.7	104.0	86.0	78.1	60.9	49.8	55.8	72.9	96.3	107.5
Jan. 28	92.9	73.8	99.6	86.5	79.5	62.3	50.8	56.2	72.9	97.4	109.8
Feb. 4	90.7	70.9	100.8	83.8	81.8	66.9	49.9	56.0	74.9	100.8	111.3
Feb. 11	92.1	71.2	101.9	85.9	82.7	70.7	48.7	55.5	75.4	100.9	111.7
Feb. 18	91.1	71.9	108.8	81.8	82.8	72.4	48.3	54.5	76.0	97.7	112.6
Feb. 25	89.3	70.3	112.8	83.4	80.5	75.5	46.0	55.1	75.8	99.7	109.2
Mar. 4	91.5	70.1	117.9	87.7	81.1	76.8	47.4	54.1	79.2	98.3	113.5
Mar. 11	92.7	70.8	112.7	89.7	82.0	78.6	43.4	54.8	80.6	97.5	114.8
Mar. 18	93.3	71.3	113.1	86.0	84.0	79.9	42.7	54.4	81.3	98.1	115.0
Mar. 25	93.2	72.4	114.0	91.2	84.0	79.7	44.6	53.5	80.6	99.6	115.0

March 25 eased seasonally to 2,198,681,000 kilowatt-hours. This represents the third weekly decline for this industrial indicator, but output still remains substantially above that of the corresponding week last year, when production stood at 1,975,239,000 kilowatt-hours. Despite the decline during the week ended March 25, the year-to-year gain has widened to a new 1939 peak.

Revenue freight carloadings registered an encouraging increase during the week ended March 25 to the highest level of the year. Freight traffic in that week was placed at 605,462, an increase of 10,894 cars over the preceding week. It compares favorably with the 572,952 cars loaded in the corresponding week of 1938.

PRODUCTION UNCHANGED DURING FEBRUARY

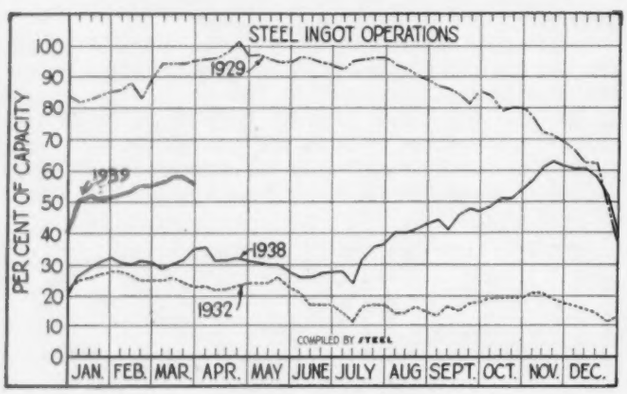
Failure of industrial production to record the normal seasonal improvement during February forced the Federal Reserve board's seasonally adjusted index to decline three points to 98 per cent for the month. In February of last year the index stood at 79. However, in the first three weeks of March, industrial activity showed seasonal increases, which would indicate that the seasonally adjusted index will remain substantially unchanged for last month. Factory employment and payrolls increased somewhat less than is usual between the middle of January and the middle of February, while distribution of commodities to consumers remained at about the same volume in February as in January. Commodity prices continued to show little change during February.

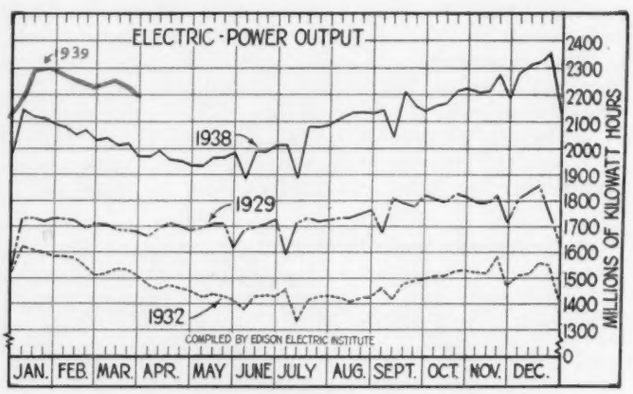
AUTOMOBILE OUTPUT DECLINES SEASONALLY

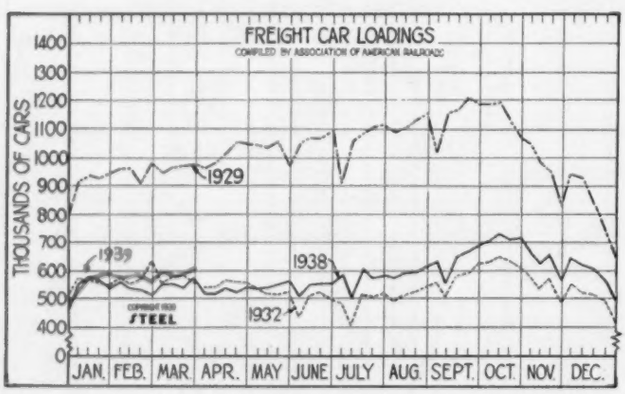
Production of automobiles, including passenger cars and trucks, in the United States and Canada, declined 41,805 units to 312,141 during February, but remained substantially above the 202,589 units assembled in the corresponding months last year. A substantial improvement in automobile production from the moderately lower levels during January and February is indicated for March. Early estimate of 390,000 units produced during March represents a still further increase over the comparable month of last year.

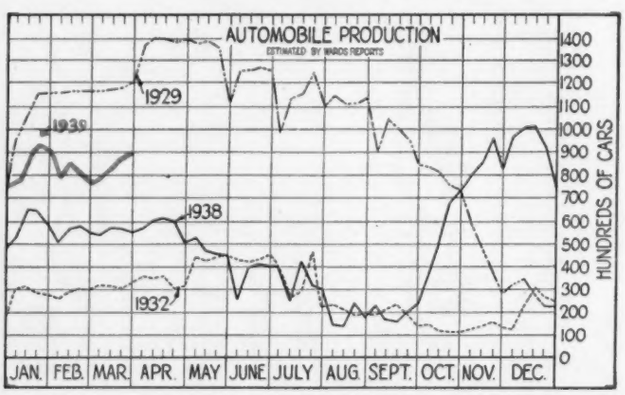
COMMERCIAL FAILURES DECREASE SHARPLY

Commercial failures during February recorded a sharp decline from the January level. The 963 disasters in February, with liabilities of $12,788,000, represent a decrease of 23.8 per cent from the 1263 failures in January with liabilities of $19,122,000. In the comparable month last year failures numbered 1149, with liabilities totaling $21,028,000.

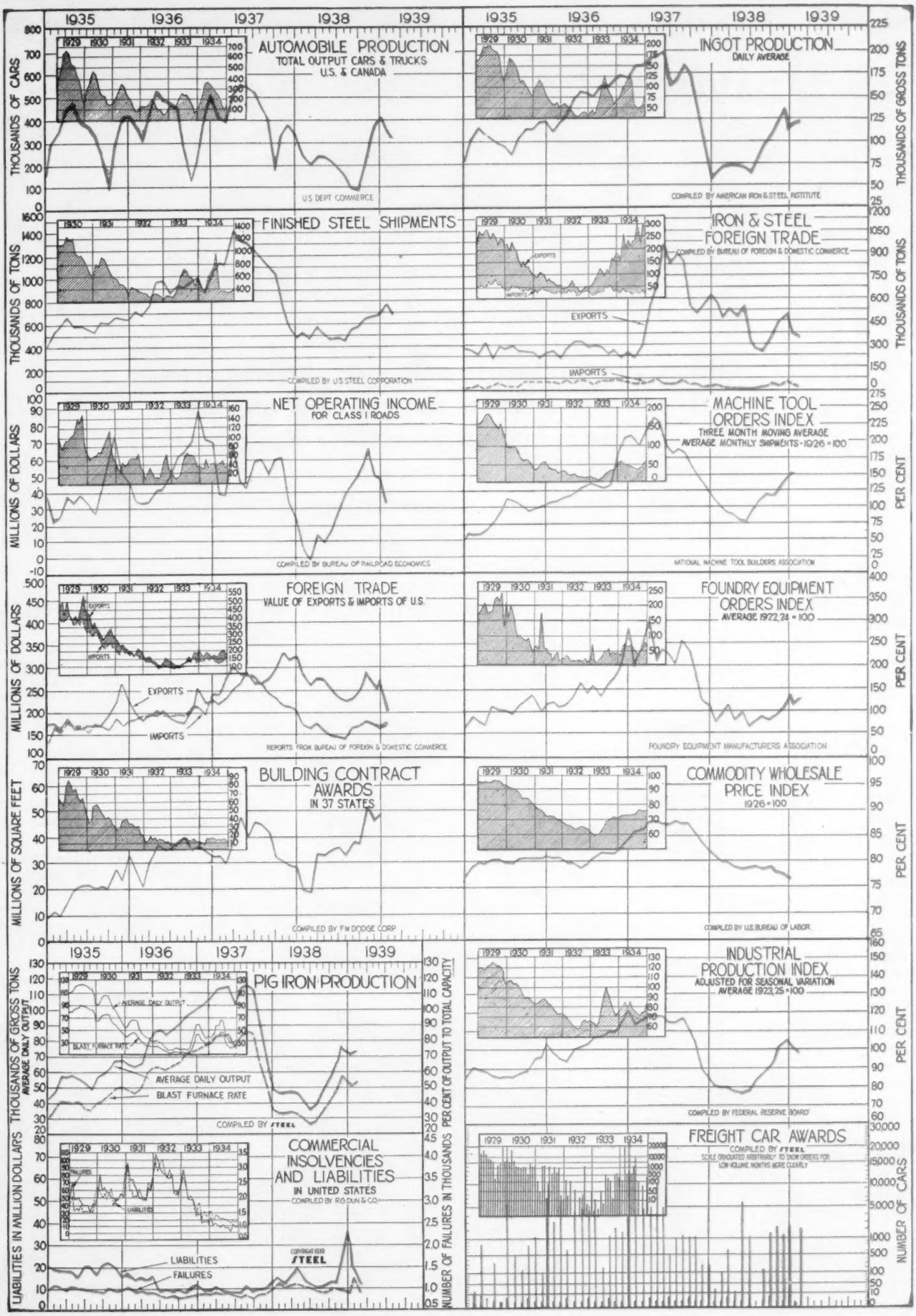








Week ending	Steelworks Operating Rate Per Cent			Electric Power Output Million KWH			Freight Car Loadings Thousands of Cars			Weekly Auto Output		
	1938	1932	1929	1938	1932	1929	1938	1932	1929	1938	1932	1929
Dec. 17	58.0	14.0	63.5	2,332	1,563	1,841	606	517	923	102,902	30,589	33,293
Dec. 24	52.0	12.0	63.5	2,362	1,554	1,860	574	495	843	92,890	27,396	23,216
Dec. 31	40.0	13.0	38.5	2,120	1,415	1,638	500	407	638	75,215	25,598	23,967
	1939	1938	1932	1929	1939	1938	1932	1929	1939	1938	1932	1929	1939	1938	1932	1929
Jan. 7	51.5	26.0	25.0	84.0	2,169	2,139	1,619	1,542	531	552	573	799	76,685	54,084	30,755	75,000
Jan. 14	52.0	29.0	26.0	82.0	2,269	2,115	1,602	1,734	587	580	572	914	86,925	65,735	31,416	95,000
Jan. 21	51.5	30.5	27.0	83.0	2,289	2,108	1,598	1,737	590	570	562	932	90,205	65,418	29,365	105,000
Jan. 28	51.5	33.0	28.5	84.0	2,292	2,098	1,588	1,717	594	553	560	926	89,200	59,365	28,950	115,000
Feb. 4	53.0	31.0	28.5	85.0	2,287	2,082	1,588	1,728	577	564	575	947	79,410	51,443	27,110	116,000
Feb. 11	54.0	30.0	27.0	86.0	2,268	2,052	1,578	1,726	580	543	562	956	84,500	57,810	29,320	116,000
Feb. 18	55.0	31.0	25.0	88.0	2,249	2,059	1,545	1,718	580	536	572	958	79,860	59,100	30,410	116,500
Feb. 25	55.0	30.5	25.0	83.0	2,226	2,031	1,512	1,699	561	512	636	907	75,660	56,977	30,150	116,500
Mar. 4	56.0	29.5	25.0	89.5	2,244	2,036	1,519	1,707	599	553	560	977	78,705	54,440	31,390	116,500
Mar. 11	56.5	30.0	25.5	94.5	2,238	2,015	1,538	1,703	592	557	575	946	84,095	57,438	31,110	116,500
Mar. 18	56.5	32.0	24.5	94.5	2,225	2,018	1,537	1,687	594	540	585	958	86,725	57,558	30,590	117,000
Mar. 25	55.5	35.0	23.0	94.5	2,199	1,975	1,514	1,683	605	573	561	961	89,400	56,800	32,892	117,500


AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS U.S. & CANADA
U.S. DEPT COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
FINISHED STEEL SHIPMENTS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
NET OPERATING INCOME
FOR CLASS I ROADS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS - 1926 = 100
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922-24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACT AWARDS IN 37 STATES
COMPILED BY F.W. DODGE CORP.
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
COMPILED BY STEEL
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923-25 = 100
COMPILED BY FEDERAL RESERVE BOARD
COMMERCIAL INSOLVENCIES AND LIABILITIES IN UNITED STATES
COMPILED BY R.G. DUN & CO.
FAILURES
LIABILITIES
COPYRIGHT 1939 STEEL
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW-VOLUME MONTHS MORE CLEARLY
THOUSANDS OF CARS
THOUSANDS OF GROSS TONS
THOUSANDS OF TONS
MILLIONS OF DOLLARS
PER CENT
MILLIONS OF SQUARE FEET
THOUSANDS OF GROSS TONS AVERAGE DAILY OUTPUT
PER CENT OF OUTPUT TO TOTAL CAPACITY
LIABILITIES IN MILLION DOLLARS
NUMBER OF FAILURES IN THOUSANDS
NUMBER OF CARS

Universal FATIGUE Tester

Design, materials and production of automotive parts are tested under normal plus abnormal loads to assure against possibility of failure in service. Unit described here makes both constant "strain" and constant "stress" tests

By F. BUCKINGHAM
Vice President
The Magnetic Gauge Co.
Akron, O.

■ A TESTING machine with an electric eye to guide its strokes is battering out new data on the endurance of Ford V-8 car and truck parts for Ford Motor Co. engineers. The machine, described by an engineer as "a million miles of rough road in a 10-foot box," subjects Ford parts in a few hours to all the stresses and strains they would meet in years of ordinary use.

A universal fatigue testing machine was required on which any part from a motor car or truck could be attached and tested to failure. It was to be of the reciprocating type with adjustable stroke. The moving head must exert a maximum plus and minus force of 3000 pounds and the force had to be indicated accurately while tests were being made at speeds of 5 to 400 strokes per minute.

A further and important requirement was that this be in effect a constant "stress" machine rather than constant "strain." Dead weight machines are of the constant stress type but are difficult to construct for such loads. In constant strain machines, as cracks develop and the part begins to weaken, the actual load (stress) drops off. So this machine was to be constructed to automatically extend its stroke and maintain the load or stress on the part at the present value until ultimate failure.

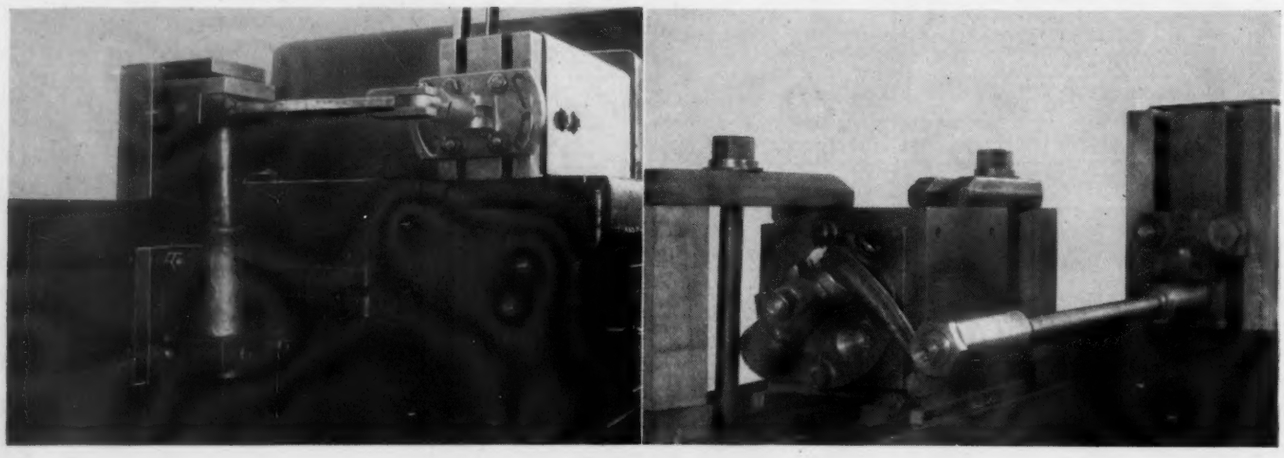
Engineers of Baldwin-Southwark Corp., Philadelphia, developed a unique and versatile machine meeting these requirements, as will be evident from the following description.

Every manufacturer of motor cars carefully investigates the failure of parts in service. They wish assurance that there will be no future failures due to design or manufac-

Abstract from article in "Baldwin-Southwark" magazine published by Baldwin-Southwark Corp., Philadelphia.

Fig. 1—Torsional fatigue tests of welds on 2¾-inch round pipe to copper-silicon iron

Fig. 2—This is a fatigue test setup for use in checking a spindle



ture error, weak materials or unknown service stress. To have such assurance they maintain large laboratories equipped with elaborate and exact apparatus in which materials and processes are investigated.

Pulling tests, compression tests, shearing, hardness, twisting, impact and fatigue tests—all are used in the selection of materials and designs. But one further step in the laboratory is necessary to insure trouble-free service. Parts must be tested under maximum, plus service conditions, to determine what combination of material and design will stand the "gaff," since it is well known that cars, trucks and busses are frequently overloaded, or if not overloaded they are otherwise abused and receive unforeseen shocks and stresses which cause failures.

A universal fatigue testing machine, as assembled in the Baldwin-Southwark shops in Fig. 3, has the casing door open to show the flywheel and mechanism for stroke adjustment. At the extreme right is shown the box containing the electrical load indicating and maintaining mechanism. On the machine cover are push buttons for start and stop, a speed indicator, and below it a handwheel for speed regulation; while below the flywheel is a projecting lever for shifting from slow to fast speeds or vice-versa.

Operating Mechanism Enclosed

The machine is operated by a motor directly coupled to a variable speed transmission which is connected, by means of V-belt drive, to a 2-speed gear shift which drives the flywheel. A connecting rod is adjustably attached to the flywheel and pinned to a reciprocating slide which runs in horizontal ways in the housing. All of this operating mechansm is fully enclosed.

Attached within the slide by means of a pin is a tension-compression weighing ring similar to those used in calibrating testing machines. The lug on the opposite side of this ring is attached to a work-head from which connection is made to specimens to be tested. Several different types of connections are shown in Figs. 1, 2, 4, 5 and 6.

The work-head is flexibly held to the slide in the direction of the reciprocating motion but rigidly held in other directions. As resistance to motion is exerted by the specimen, the force is transmitted to the work-head and thence to the weighing ring. The ring deforms in proportion to the force exerted and this deformation operates an inductor telemeter which causes a light beam to travel across a scale graduated in pounds, thus indicating the force or load exerted on the specimen. This force is exerted in both directions when the set-up is such as to apply deformation to the part in both directions. Consequently when a test is being made, a band of light extends across the scale from plus to minus, the limits of which indicate the plus and minus load.

Means are provided to lock the work-head to the slide when it is desired to only deform the specimen through a constant distance cycle without regard to the load or its maintenance.

A most important feature of the machine was to be its ability to maintain the load applied at the start of the test even as the specimen weakened through the gradual development of incipient cracks. To accomplish this, a unique type of crank adjustment mechanism was designed.

Through the open door of the cover can be seen the flywheel and crank with its screw adjustment mechanism. Using a hand wrench, desired settings for load or stroke can be made before the machine is started. To maintain the load, a mechanism on the opposite side of the flywheel is provided, so arranged that when the light beam on the scale falls below the predetermined load the crank adjustment screw is turned slightly at every revolution of the flywheel until the stroke is increased sufficiently to bring the load back to its original value, and restore the light band to its original limits.

If specimens of unequal strength in the opposite sides, or parts that are unsymmetrical and thus show failure in one direction more rapidly than the other, are tested, provision can be made in this type of machine to increase the stroke by load

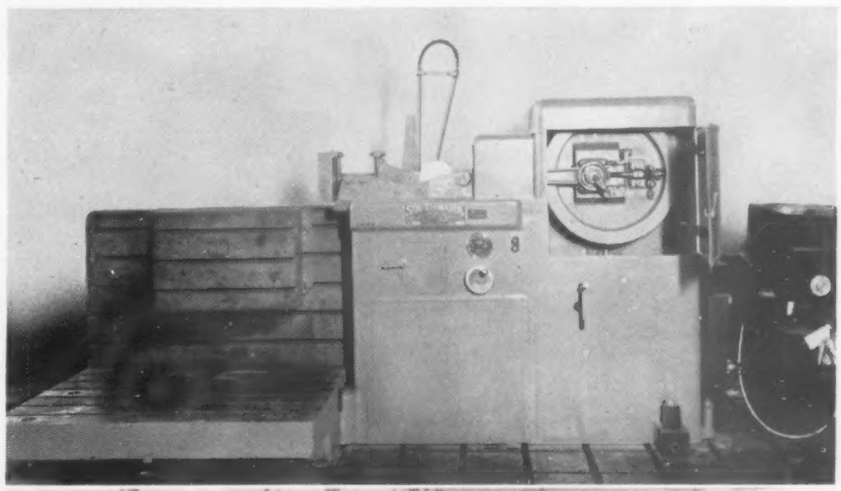


Fig. 3. (Upper)—View of testing machine with door showing internal mechanism. Fig. 4. (Lower)—Truck axle housing set up for a transverse fatigue test

Fig. 5—Fatigue test on rear radius rod assembly

changes from either side or both sides as desired.

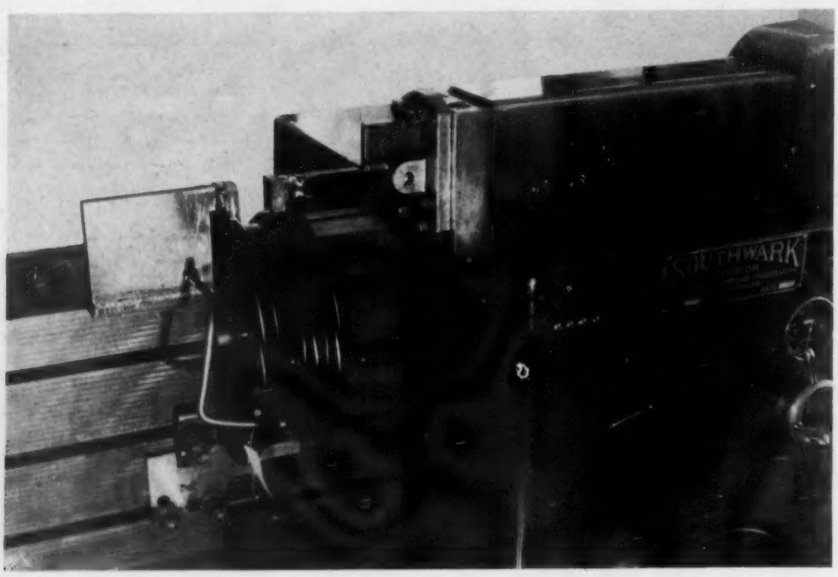
Still another necessary feature is incorporated. The inertia of connecting members between ring and specimen must be counterbalanced. The set-up for testing the front spindle, Fig. 2, shows a connection from the spindle to the work-head and a block on the head. These parts together with the work-head and one-half the weighing ring constitute a mass with considerable inertia when rapidly reciprocated. This will appear as a load on the specimen if it is not properly compensated. However, provision is made whereby the adjustment of a weight on a simple lever balances out this inertia effect when the machine is run idle at the speed and stroke desired, with the connecting parts attached to the work-head but detached from the specimen.

Five illustrations of typical tests are shown. Four are parts tests, while the fifth is an investigation of weld efficiency under reverse torsions and between tubes of different metals.

In the truck axle housing transverse test, Fig. 4, it will be noted that the force of the work-head is multiplied through a lever pinned to a block on the base. In this test the leverage is 5 to 1, so a load of 2500 pounds through the weighing ring applied 12,500 pounds to the truck housing. These typical tests illustrate how loads of tension, compression, transverse or torsion can be applied. Through suitable leverages they can be multiplied to values considerably above the weighing ring capacity of 3000 pounds.

Loads can be applied at constant stroke until failure, or with automatically increasing stroke to maintain constant load until failure. Loads can be controlled automatically on unsymmetrical parts or on parts that are weaker in one direction than the other. The inertia effects of the necessary heavy connecting parts between ring and specimen can be easily counterbalanced. Altogether it is an extremely versatile machine duplicating road conditions, plus.

Fig. 6—Wheel rims undergoing fatigue test



♦

How Can Government Best Be Reorganized?

■ *Reorganization of the National Government*, by Lewis Meriam and L. F. Schmekebier; cloth, 272 pages, 5¼ x 8¼ inches; published by the Brookings Institution, Washington; supplied by STEEL, Cleveland, for $2; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London S.W.1.

The objective of this volume is to present a general analysis of problems involved in reorganizing the executive branch of the national government, to consider the possibilities and the limitations of several proposed types of reorganization and the arguments for and against them and to offer suggestions as to possible procedures.

The first part is devoted to an analysis of the problem, which is handled by Mr. Meriam. The second part is a history of reorganization efforts, by Mr. Schmeckebier. After defining certain major concepts of reorganization the author gives factual background as to possible reductions in government expenditures that may be reasonably expected to result. Various proposals for structural reorganization are described, with possible elimination of overlappings, duplications and conflicts.

An important chapter is devoted to consideration of curtailment of functions and activities. This considers the question of enlarged control by the President and lessened authority of congress and the courts. This section then summarizes by three major questions: What is necessary if substantial expenditure reduction are to be made? What are the devices for securing economy and efficiency? Is a special reorganization bill necessary?

The second part deals with the history of past efforts at reorganization. Appendices contain much factual information as to existing federal agencies and establishments, their budgets and expenditures. An index is provided.

Plating Process Has High Cathode Efficiency

■ Claimed to be four times as fast as conventional copperplating processes and to have 100 per cent cathode efficiency at high current densities, a highspeed method has been announced by E. I. du Pont de Nemours & Co., Wilmington, Del.

Deposits are said to be free from pits and uniformly bright. Finish possesses good grain structure, can be buffed and is suitable for either bright or dull nickel deposits. It takes only 10 to 20 minutes to form coatings from 0.001 to 0.003-inch thick. Cyanide decomposition is negligible, and obnoxious fumes are eliminated by the process. It can be installed in usual cyanide plating equipment.

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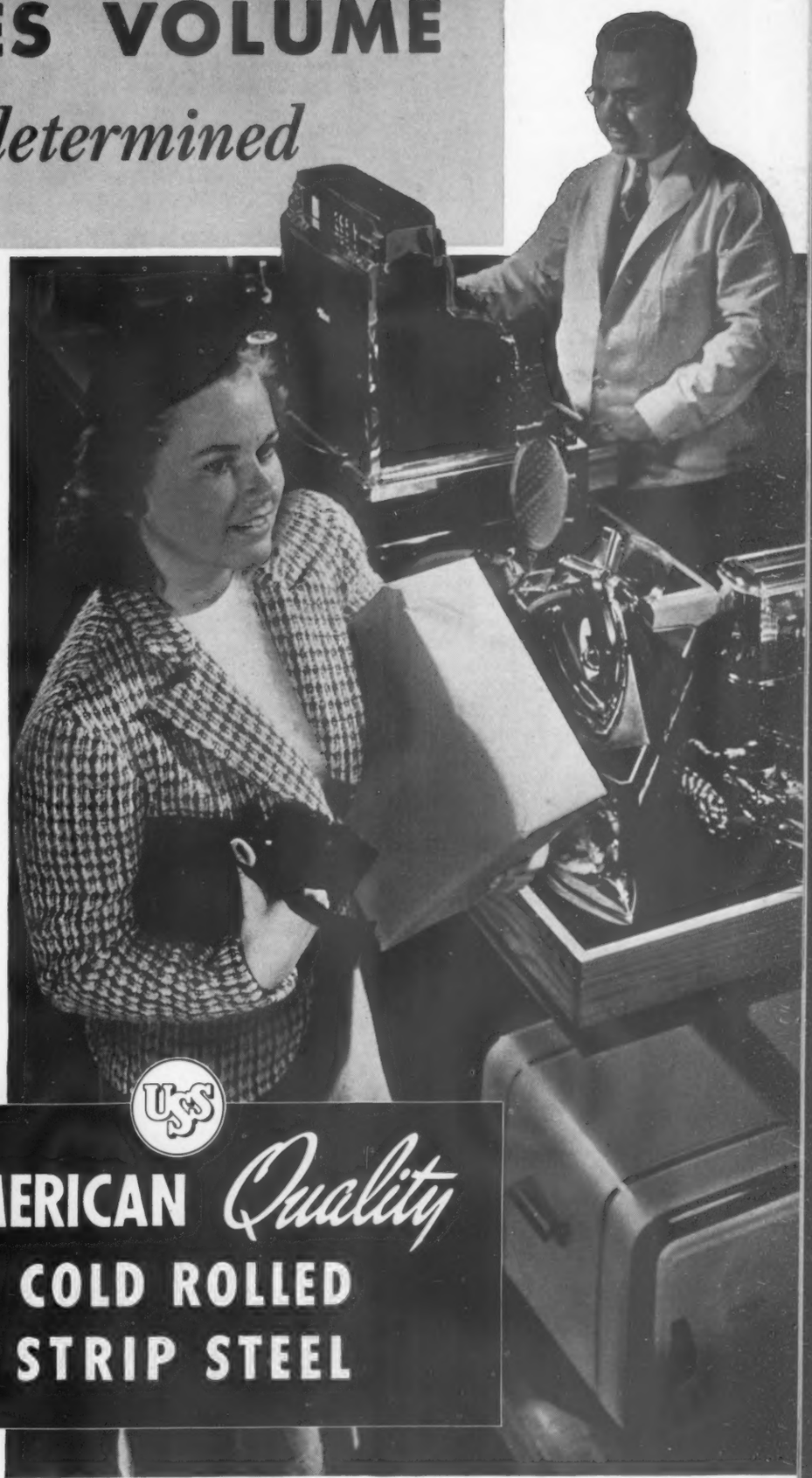

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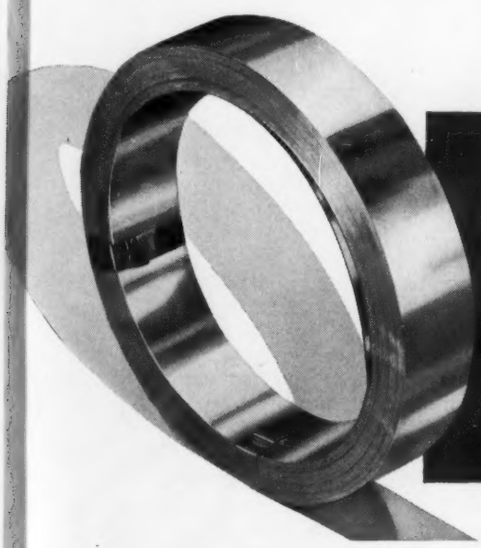

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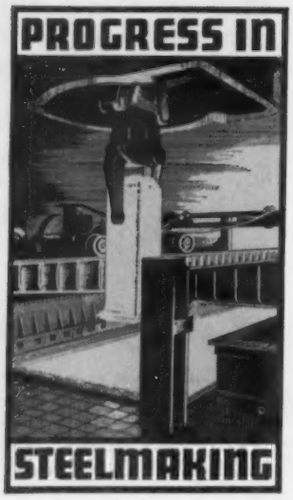


Insulating Firebrick

Specifications for insulating firebrick at present appear somewhat confusing. The discussion of various physical and chemical properties of insulating firebrick as presented here may help clarify the factors involved

By W. RAYMOND KERR
Chief Ceramic Engineer
Armstrong Cork Co.
Lancaster, Pa.

■ ALTHOUGH relatively new, insulating firebrick rapidly is finding increasing application, in many instances outdistancing formation of adequate specifications. Already insulating firebrick has been specified for use to back up refractory walls and other installations ranging up to where it is directly exposed to the flame in high-temperature furnaces.

Physical and chemical properties of insulating firebrick vary widely and in some applications may be of great importance. Chemical composition is unimportant in most cases provided other properties of the brick enable it to withstand working conditions of the application. However, certain chemical characteristics should be kept in mind.

Where strongly reducing conditions are maintained, a low iron content should be specified, about 2 per cent for instance. Insulating firebrick as a class appears less likely to disintegrate under reducing conditions than are more dense refractories. This may be attributed to larger pore size of the insulating firebrick where the carbon granule deposited by the reducing atmosphere may have more room to grow before it finally exerts sufficient pressure to crack the structure.

Retarding Disintegration

Another factor that retards disintegration of light weight brick is its high permeability, permitting sufficient oxygen to enter to partly burn the carbon deposited within the brick.

While siliceous insulating firebrick may have somewhat more of a tendency to spall than fireclay insulating brick originally fired at the same temperature, there are a number of marked exceptions which indicate the silica content cannot be considered a deciding factor in the chemical constitution of insulating firebrick.

Specifying alumina is believed of little value in insulating firebrick as observations in actual practice have not confirmed the idea that a high alumina content makes a brick that has less tendency to spall.

Pyrometric cone equivalent (P.C.E.) usually is no indication of the useful range of an insulating firebrick. It merely serves as a guide to the refractoriness of the product. Insulating firebrick usually is much less dense than firebrick refractories and so reacts differently under similar temperature conditions.

A factor which determines the temperature at which insulating firebrick can be used is the temperature at which the brick is originally fired. This point is probably of greater importance than in the case of firebrick. Since actual pyrometric cone equivalent of any insulating firebrick is usually so greatly in excess of the firing temperature as to bear no direct relationship to it, it is of little importance in specifications. The greatest value of a pyrometric cone equivalent test in the case of insulating firebrick is as a factor of safety but not as a guide to the useful temperature range of any particular brand.

Bulk density is important from several angles and so should be included in all specifications. A saving in weight usually can be considered in designing a furnace and so produce savings in steel work.

Specific heats of various clay insulating firebricks are similar. For this reason a brick of low bulk density has lower heat capacity and so shows a greater saving in fuel than a brick of greater bulk density. Also, greater heat storage permits greater flexibility in heating and cooling, resulting in more heats per furnace day with the lighter weight brick.

Low bulk density for any given brick almost invariably means low thermal conductivity. While this does not necessarily mean the lightest weight brick is the best insulator, this usually is the case. Thus, specifying a figure for bulk density may be of value.

If the insulating firebrick is to back up a refractory, density should be relatively low, perhaps 30 to 35 pounds per cubic foot. For light duty service in average industrial furnaces, a considerable range in density may be permissible, including values from 35 to 50 pounds per cubic foot. Furnaces operated under relatively severe conditions may require a higher density ranging up to 65 pounds per cubic foot.

Made to Close Tolerances

Accuracy of dimensions may be of considerable importance since much insulating firebrick is laid dry or with thin joints to obtain low heat losses. Modern production methods are quite accurate and permit making brick extremely close to size. A tolerance of 1/32-inch plus or minus is believed reasonable since the importance of accuracy in finishing to a standard dimension appears quite generally understood.

Porosity varies almost directly with bulk density. Thus, where a bulk density is specified, it is unnecessary to mention pore size or porosity. Since the strength and other properties required effectively limit the pore size permissible in insulating firebrick, specifying porosity ap-

Advertisement

COPPER ALLOY BULLETIN

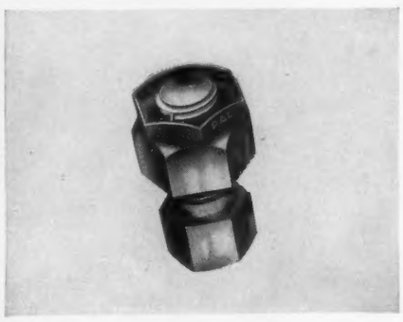
Reporting News and Technical Developments of Copper and Copper-Base Alloys

APRIL — "Bridgeport" Brass Co. — 1939

DURONZE PALNUTS USED IN ELECTRICAL EQUIPMENT

Palnuts—made of Duronze*—are extensively used as lock nuts in many types of electrical equipment for both railway and industrial service. Typical applications are on disconnect switches, clamps, bus fittings, and other parts where non-ferrous bolts must be used for their electrical conductivity and corrosion resistance.

Manufactured by The Palnut Company, Irvington, N. J., palnuts are provided with resilient spring jaws that grip the root of the bolt thread and provide spring tension against the regular nut. Palnuts are applied to the bolts on top of the regular nuts, and are tightened with the fingers. A further quarter-turn with a wrench locks them securely in place.



HIGH-CONDUCTIVITY COPPER ALLOYS MEET SPECIFIC NEEDS OF ELECTRICAL INDUSTRY

Good Balance Can be Obtained between Conductivity and Other Properties

The electrical industry, which accounts for more than one-fifth of the total consumption of copper, finds increasing applications for this versatile metal in the form of alloys which give higher mechanical strength, corrosion resistance, or other needed characteristics without undue sacrifice of electrical conductivity.

In such applications as the windings of electrical machinery, where high conductivity in a minimum space is the basic requirement, pure copper is of course used almost exclusively. In many other electrical applications, it is necessary to effect a compromise between electrical conductivity and other properties.

The wide range in which the copper alloys are manufactured makes it comparatively simple to select an alloy that gives the best balance of characteristics. Brass is frequently used for the fabrication of many detail parts, because of the ease with which it can be stamped or molded into complicated shapes.

Phosphor bronze, because of its high resiliency, is very widely used for the fabrication of spring contacts. Duronze*, a silicon bronze developed by Bridgeport metallurgists, is frequently used in place of phosphor bronze for these applications, particularly as an economy measure. In its resistance to corrosion, Duronze is superior to many of the other copper alloys. A highly important advantage of Duronze in the manufacture of electrical hardware is the fact that bolts and nuts made from it can be used over and over again, as they have little tendency to deteriorate upon

(Continued on Following Page, Column 2)

Runners and Risers for Non-Ferrous Castings

A recent article in *Metal Industry* (London) discusses the use of runners and risers in casting various bronzes. According to the author, good results were obtained by casting small phosphor bronze parts four to a feeder. In this way the hottest metal was found at the desirable spot—the joint between runner and casting.

Manganese bronzes and high tensile brasses were found to require special care, because of their tendency to draw in unexpected places. This tendency may sometimes be overcome by running in the top part instead of the bottom. Risers for manganese bronzes should be cut so that the neck of the riser is as short as possible, and a long stream of metal should be avoided when pouring.

COPPER AND BRASS EXHIBIT AT NEW YORK WORLD'S FAIR

Copper & Brass Research Association

The copper and brass industry's exhibit at the New York World's Fair, which opens the end of this month, will be housed in the Metals Building. The accompanying architectural rendering shows a part of the complete exhibit, which will include murals and dioramas tracing the history of copper through the ages, an animated copper "atom," methods of mining, and the use of copper for electrical applications.

Westinghouse Electric & Manufacturing Company

A typical group of brushes and connectors formed from spring brass with necessary electrical and mechanical properties.

COPPER ALLOY BULLETIN

TYPES OF COPPER

This is the third of a series on the various types of copper, their relative merits and uses.

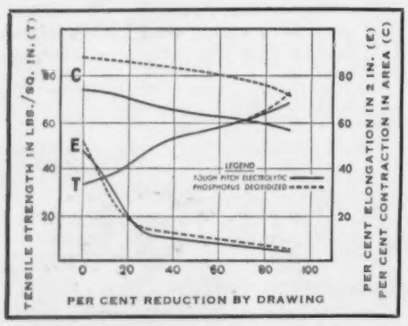
Further Effects of Presence of Oxygen

In addition to the effects produced in copper by the presence of oxygen, which were discussed in the March issue of the COPPER ALLOY BULLETIN, other differences must be noted between *Tough Pitch* and *Deoxidized Copper*. All Tough Pitch Copper castings have on one surface a segregation of cuprous oxide. In wire bars and flat cakes this surface is a large proportion of the total surface of the casting. This segregation of oxide in the set surface must be removed before the copper is suitable for polishing and severe drawing operations. Many refineries remove the set surface of wire bars by scalping before shipment. In the production of cakes for sheet this difficulty has been largely eliminated by the use of moulds which confine the set surface to an end or side of the cake rather than to one of the rolling surfaces.

Tough Pitch Copper, however, is superior to most Deoxidized Copper for purposes in which high electrical conductivity is essential, as in electrical wires and electrical devices generally. It is also slightly superior to Deoxidized Copper for machining operations.

Following is a comparison of the properties of Tough Pitch and Deoxidized Copper:

	Electrolytic Tough Pitch	*Phosphorus Deoxidized*
Specific Gravity—20° C..	8.89	8.89
Density, lbs./cu. in.....	.3212	.3212
Melting Point—°C.....	1083	1083
Linear Coefficient of Expansion/° F.....	0.0000094	0.0000094
Electrical Resistivity—ohms/circ. mil. ft.....	10.64	10.64–11.80
Electrical Conductivity—%	97.5 min.	97.5–87.0
Thermal Conductivity—%	100	90 (approx.)
Modulus of Elasticity—lbs./sq. in.....	15,000,000	15,000,000



The accompanying curves give a comparison of the properties of Tough Pitch Electrolytic and Phosphorus Deoxidized Copper as affected by cold drawing.

Fabricators desiring information on the various types of copper or copper alloys in specific uses are invited to discuss their problems with Bridgeport Brass Company.

ELECTRICAL INDUSTRY

(Continued from Preceding Page, Column 3)

successive loosening and tightening, which is frequently made necessary by service requirements.

The electrical industry also makes wide use of the copper alloys for non-current-carrying applications, chiefly in the manufacture of household appliances, where attractive appearance is the important consideration. For such applications it is customary to use brass sheet, which must have a smooth surface and must be properly annealed to insure economical finishing operations. For both current-carrying and non-current-carrying applications, product quality and economy depend to a considerable extent upon the selection of the proper alloy and temper to meet the specific requirements involved. Bridgeport metallurgists will gladly assist in this selection.

Electrolytic Process Gives Wide Color Range

Almost every color of the rainbow can be produced electrolytically, without the use of colored lacquers, dyes, or pigments, by a process which varies the color simply by varying the length of time that the article remains in the plating bath. The composition of the plating bath is not changed in any way to effect the color variations.

In this process, an installation of which has been made at the plant of L. F. Grammes & Sons in Allentown, Pa., pure metallic copper is used as the anode and the plating deposit is cuprous oxide. The bath is operated at low voltage and current density, the desirable voltage being approximately 0.4 volts, and the current density about 0.5 amperes per square foot.

The color is the result of the reflection and refraction of light passing through the semi-transparent coating. As the thickness of the coating increases, the color changes from violet to blue, green, yellow, and red. With increased thickness of coating, the color cycle is repeated, and in each succeeding cycle the colors become darker, so that the process controls both the color and the tone.

Patents on the process are owned by Kansas City Testing Laboratory. Licenses are issued by United Chromium, Inc.

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. Further information on any of these items may be obtained by writing the Bridgeport Brass Company, which will gladly refer readers to the manufacturer or other source.

A flexible sanding pad is molded of non-breakable rubber. It is reported to be suitable for feather edging or flat sanding. It is available in three sizes.

A new lubricant is said to be especially suitable for conveyors operating in enameling and baking ovens and other high-temperature locations. It consists of colloidal graphite suspended in kerosene, which evaporates to leave a thin deposit of the colloidal graphite.

A tube expander is designed for rolling in copper or brass tubes into boilers, condensers, and similar equipment. It may be operated by hand or used with a power unit. It is reported to be especially suitable for tubes of small diameter.

A vacuum lifter is designed for lifting polished metal sheets without leaving smudge marks. It uses vacuum rubber cups provided with release operated by a flick of the finger. Available in models for light, medium, and heavy lifting.

A new plating barrel, which is intended for hot solutions, is said to employ a novel method of exhausting fumes. A series of small ducts directly over the anode rods connect with the main duct on the side, without interfering with the placement of the cylinders in the tanks.

A sheet metal former is said to provide a means of forming or flanging the edges of sheet metal when the contour is so irregular that hand work would ordinarily be necessary. Machine uses a short brake oscillating against a holding-down tool at speeds of 250 or 500 strokes per minute. Each stroke brings up a small part of the sheet.

A congestion eliminator for steam mains uses a copper coil. A special rust eradicating product is introduced into the steam main through openings in valves.

Electric heaters with water-cooled electrodes may be used on non-ferrous metals for upset and drop forge work. They are available in seven different models, differing principally in capacity and number of electrodes.

A tube coupling is reported to be suitable for maintaining tight joints on flared tubes. The addition of a locking nut is said to relieve undue strain on the flare. Couplings made from bar brass are intended for use with copper or other soft tubing. A second series is suitable for use with hard copper or with steel.

A marking hammer for bronze, brass, and other materials is electrically operated. It is available with a diamond point for permanent marking. Operates on 110 volts, 60 cycles.

PRODUCTS OF THE BRIDGEPORT BRASS COMPANY

Executive Offices: BRIDGEPORT, CONN.—Branch Offices and Warehouses in Principal Cities

SHEETS, ROLLS, STRIPS—*Brass, bronze, copper, Duronze,** for stamping, deep drawing, forming and spinning.

CONDENSER, HEAT EXCHANGER, SUGAR TUBES—For steam surface condensers, heat exchangers; oil refineries, and process industries.

*Trade-name.

PHONO-ELECTRIC* ALLOYS—High-strength bronze trolley, messenger wire and cable.

WELDING ROD—For repairing cast iron and steel, fabricating silicon bronze tanks.

LEDRITE* ROD—For making automatic screw machine products.

BRASS "Bridgeport" CO.

Established 188

COPPER WATER TUBE AND FITTINGS—For plumbing, heating, underground piping.

DURONZE ALLOYS—High-strength silicon bronzes for corrosion-resistant connectors, marine hardware; *hot rolled sheets* for tanks, boilers, heaters, flues, ducts, flashings.

BRASS, BRONZE, DURONZE WIRE—For cap and machine screws, wood screws, rivets, bolts, nuts.

FABRICATING SERVICE DEPT.—Engineering staff, special equipment for making parts or complete items.

BRASS AND COPPER PIPE—"Plumrite"* for plumbing, underground and industrial services.

BRIDGEPORT BRASS

pears unnecessary. Most manufacturers employ a pore size small enough to produce a brick of uniform texture and relatively smooth appearance.

Permeability is a property that is hard to control. It should be included in specifications only when it cannot be compensated for or minimized by use of tight steel-shell construction to retard air infiltration or where reducing of permeability by means of a coating or facing on the inside of the furnace lining may not be practical. This latter method of reducing air infiltration often cuts the amount of air entering by 50 per cent. Usually such a coating consists of two applications of a refractory air-set cement, each of eggshell thickness.

Strength Aids Shipment

Compressive or cold crushing strength is not so important in modern constructions except where unusual thrusts occur. Ten pounds per square inch is probably high for sidewall constructions. Arches may be required to withstand higher loads than this, especially during the heating up period when a side thrust is exerted due to expansion of the brick. However, loads in excess of 50 pounds per square inch probably are rare.

On the other hand, the compressive strength is a good measure of how well the insulating firebrick will withstand shipment. A compressive strength less than 150 to 175 pounds per square inch usually is undesirable from the angle of shipment. A minimum specification figure near this value perhaps may help to assure receiving shipments without breakage.

Modulus of rupture or transverse strength is of little importance except where a single span is concerned or where a wall tie-in is involved. Also, modulus of rupture falls off with repeated heating and cooling. Usually it would be of more value if this factor were known for the brick in a heated condition, but this figure is difficult to determine without special apparatus and is further complicated at the higher temperatures by the additional factor of plastic flow.

Thermal conductivity is a most important factor and should be included in all specifications. In backup installations, it is extremely important. In such installations as electric furnaces, it is desired to save all the current possible. Many such installations employ several inches of diatomite powder on the outside and at least 9 inches of backup brick with an insulating firebrick lining of a thickness sometimes exceeding 9 inches. For such an application, a maximum figure of 2 B.t.u. at 1500 degrees Fahr. mean temperature for the commercial conductivity of the backup material is suggested.

While in heat-treating applications the fuel saving is an important consideration, it must be balanced by other factors such as spalling resistance and general flexibility. Here it is recommended that the conductivity be kept under 3 B.t.u. at 1500 degrees Fahr. mean temperature.

On many installations, fuel saving is not the only consideration. A furnace may be desired that will withstand considerable punishment and yet be light in weight and have a high degree of flexibility. In this type of installation, brick usually is directly exposed. A conductivity between 3.5 and 4 B.t.u. at 1500 degrees Fahr. mean temperature appears at present to be necessary here.

Load-bearing ability of insulating firebrick rises with the temperature until a point is reached where plastic flow begins. Then strength tapers off and as plastic flow becomes more apparent, the brick slumps. Some insulating firebrick has been found to double its compressive strength when the temperature was raised as high as 1600 to 1800 degrees Fahr.

Panel type tests have been compared to load tests under soaking heat conditions. In the ordinary panel type test, little or no subsidence is shown. While bulging of sidewalls because of inadequate expansion joints, fusion due to too high a temperature and spalling of arches have sometimes been experienced, failure of insulating firebrick under load has been extremely rare. This is attributed to the steep thermal gradient that usually exists in an insulating firebrick wall.

In a load test where the brick is surrounded completely by soaking heat conditions, a point will be reached with rising temperature where plastic flow starts. However, such tests do not simulate actual furnace conditions except for piers, and in such cases a stronger brick than insulating firebrick should be used unless the required temperature is on the upward slope of the curve for temperature vs. load-bearing ability.

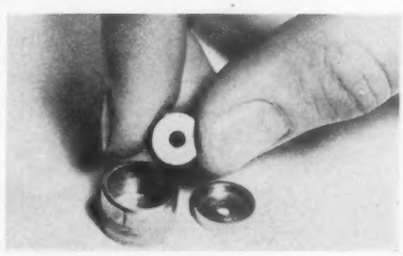
For these reasons, it appears that no hot load test is sufficiently well developed at present to be included in general specifications for insulating firebrick except, perhaps, in special cases.

Spalling resistance is an extremely important property. However there is at present no standard test for its determination although several tentative procedures have been published. Perhaps the panel type test may offer the best solution. If the A.S.T.M. method for dense refractory brick is used, it should be modified to include a less rapid cooling rate. The entire problem of panel spalling tests in connection with insulating firebrick is complicated by the extremely high rate of heat loss as compared to firebrick.

Freedom from shrinkage in service at any specified temperature is important, and some limit should be placed on the brick. Measurement of this property is somewhat contro-

Lifts 1500 Times Own Weight

■ **A 1.85-gram magnet that will lift a 5-pound flatiron has been developed by General Electric Co., Schenectady, N. Y. The tiny magnet is made of Alnico, alloy of aluminum, nickel, cobalt and iron, specially heat-treated to develop its magnetic properties. Magnetism is brought to a maximum by use of a steel sheath around the alloy pellet. This shell concentrates magnetic lines of force as a magnifying lens concentrates a diffused stream of light**



versial because of tests already existent in the A.S.T.M. manual and because panel type tests recently have been proposed. These latter ultimately may serve as the basis for an entirely new type of test on shrinkage.

Effect of time on shrinkage of insulating firebrick is decidedly important. Therefore, short-period tests should not be used as this would show some brick to an advantage that might not actually exist in service.

Since atmospheric control is common in connection with insulating firebrick installations, it may be desirable at some future date to design shrinkage tests for insulating firebrick under special atmospheric conditions. Certain atmospheres induce more shrinkage than normal oxidizing conditions.

A.S.T.M. test C93-34T for shrinkage is fairly severe. Experience shows that soaking conditions produce more apparent shrinkage than when brick is tested in a panel type test. Therefore, when the soaking test is used, allowable linear shrinkage at any given temperature may be 2 to 2½ per cent. For the panel type test, it should perhaps be as low as ½-per cent, but more experience is needed before a definite recommendation can be made.

While it is extremely difficult to discuss so many properties in such a short space, it is hoped the above will serve as a guide in preparation of better specifications for insulating firebrick.

Descaling Made Fast Work With Multiple-Flame Torch

■ RECENTLY a manufacturer of road machinery was having considerable difficulty in the removal of scale from channels used in his equipment. Principal complaint appeared to be that paint peeled off with the scale after the road graders had been in operation for several months.

Several methods of scale removal had been tried with little success. A wire brush, hammer and chisel, hand brush, etc., had all been employed with equally unsatisfactory results as only part of the scale could be removed by these older methods.

Seeking a better method, a new type of multiflame torch was tried. Developed by Air Reduction Sales Co., New York, this torch employs six 5-flame tips operating simultaneously to descale an area 6 to 8 inches wide in one pass, as seen in the accompanying illustration. All scale was found to be removed effectively from the metal. Operation of the torch was so satisfactory that officials of the company inquired if it were possible to clean up a quantity of ½-inch plate which had accumulated much rust and corrosion. This also was done successfully.

Here a special oxyacetylene torch with six 5-flame heads is rapidly cleaning the surface of structural steel members. Photo courtesy Air Reduction Sales Co., New York

Since it is frequently necessary to remove old paint from machines in this plant, formerly done by scraping off with a tool and wire brush, the descaling tip was employed for this work too. It is possible to remove more paint with it in 30 minutes than two men could remove in a day using the older method.

The torch is used from 3 to 5 hours each day in this plant for this work now. Some idea of costs for scale removal can be obtained from the following data: Descaling about 15.5 square feet of surface on a channel, 7 x 2½ inches x 15 feet, 6 inches (only one side descaled inside web and flanges) took 10 minutes and required 10 cubic feet of acetylene and 15 cubic feet of oxygen per piece. Three passes were made in cleaning a 7-inch channel. On 14 pieces of channel, the area per minute descaled was 1.55 square feet using 0.645 cubic feet of acetylene and 0.97 cubic feet of oxygen per square foot descaled. This was with a torch having six tips, each with five flames, holes of No. 70 drill size and using 12 pounds oxygen pressure, 10 pounds acetylene pressure.

Plating Improved By Electric Heaters

■ Making ambulance cots, stretchers and similar chromium plated items the Bomgardner Mfg. Co., Lakewood, O., does a large amount of chromium plating in its plant.

To maintain uniform temperatures in the plating bath, two 3000-watt electric immersion heater units with acid-resisting sheathing recently were installed. With a thermocouple in the bath and connected to a control device, the plating solution is maintained at 110 degrees, which provides uniform plating conditions.

Over nights and week-ends the temperature is maintained at 50 degrees, which makes it possible to raise the temperature to 110 degrees in about 1 hour. The gases given off by the bath contain a certain amount of chromic acid spray. A steel hood was installed surrounding the plating tank with ducts having a slot about 1 inch wide directly above the surface of the bath to permit effective removal of gases and spray. This provided much better working conditions according to an entry in the industrial heating contest recently sponsored by General Electric Co., Schenectady, N. Y.

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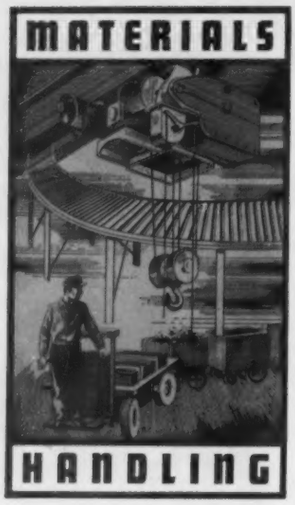

Enamelware

New continuous U-type furnace and relocation of departments and equipment greatly increases efficiency of enameling plant handling large volume of kitchen utensils. Production is raised to a capacity of 100,000 pieces of quality wear daily

■ ANOTHER step in the plant expansion program of Moore Enameling & Mfg. Co., West Lafayette, O., is marked by a series of changes completed late in 1938.

General offices were moved to new quarters, separate from the factory buildings, and the mill room office was moved closer to storage and dip tanks. Of most interest is the new continuous U-type furnace installed for production of gray ware. The changes, devised by Mr. W. B. Moore, president, and R. S. Cobb, factory manager and engineer, make possible better handling of materials in process and have increased the available space for added production.

Since its organization in 1924 the Moore Enamel & Mfg. Co. has increased its capacity and equipment a number of times, adding a new building in 1932 and another in 1936. With increased gray ware production and addition of new lines, present output consists of a full line of gray ware, color ware and white ware.

Moving the mill room equipment close to the dip tanks has proved a most valuable change as it has greatly minimized enamel handling. Moving one mill at a time permitted the relocation of the mill room without loss of production. In addition to being moved, each mill was changed from lineshaft belt drive to direct motor drive thus making a more flexible arrangement. A mezzanine floor over the new mills facilitates loading. Storage area for enamel frit and raw materials also is on the mezzanine floor.

Enamel storage tanks are located immediately adjacent to the new mill room. The gray enamel tank is of particular interest. It has a large capacity and is equipped with power driven agitators.

The new Ferro continuous U-type furnace recently installed produces ware at a chain speed of 11 feet per minute. Furnace temperature is 1650 degrees Fahr. An average of 34 gallons of fuel oil is used per hour. The support tooling consists of alloy frame baskets spaced on 4-foot centers and hung from alloy supports which are 16 inches on centers. Each basket can be loaded with 15 to 20 pieces depending upon the size and shape of the hollow ware. Furnace conveyor chain operates on a 4-inch I-beam track and is driven by a floating caterpillar drive unit.

Safety Motor Shutoff

Caterpillar drive is free to move against spring tension, the springs just balancing the pull required to move the chain. A limit switch connected to the drive motor is combined with this "floating" feature. Should the conveyor become jammed, the caterpillar drive moves forward against the springs to contact the limit switch which shuts off power to the driving motor before serious damage occurs to conveyors or furnace.

Burning zone through which the conveyor chain travels is 30 feet long. Total length of conveyor is 325 feet with 185 feet outside the furnace. Ample loading and unloading space is provided. Built in the shape of an L, the furnace is in plain view. It is 80 feet long and averages 13 feet in width. The long part of the L contains the burning zone and part of the pre-

Entrance view of Ferro, continuous, U-type enameling furnace. Photos courtesy "The Enamelist," Cleveland

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Traveling at a rate of 11 feet per minute, it is easily apparent how 100,000 pieces can be turned out daily if the chain is kept loaded like this

heat and cooling zones. This section is built of firebrick with a steel plate shell. Flues are built in the floor and run from the combution chambers to the stack. Short leg of the L is constructed of rock-wool insulated, steel panels. An air seal arrangement is located at the open end of the insulated panel section. Here thin sheets of air move across the opening both down from the top and up from the bottom to prevent excessive heat loss and to eliminate longitudinal air current induced by the moving conveyor.

Two 4-inch oil burners fire at the rear of the furnace into two of the three V-bottom combustion tunnels. V-bottom and muffle tile are of silicon carbide material to obtain fast heat transfer and low fuel consumption. Under normal load, fuel consumption averages 34 gallons per hour. Burners are capable of delivering 50 gallons per hour if required, so reserve is available.

Recording controller records the temperature in the burning zone and controls an automatic oil-air proportioning valve according to the required temperature setting. This arrangement provides continuous automatic control and makes a permanent record of temperature.

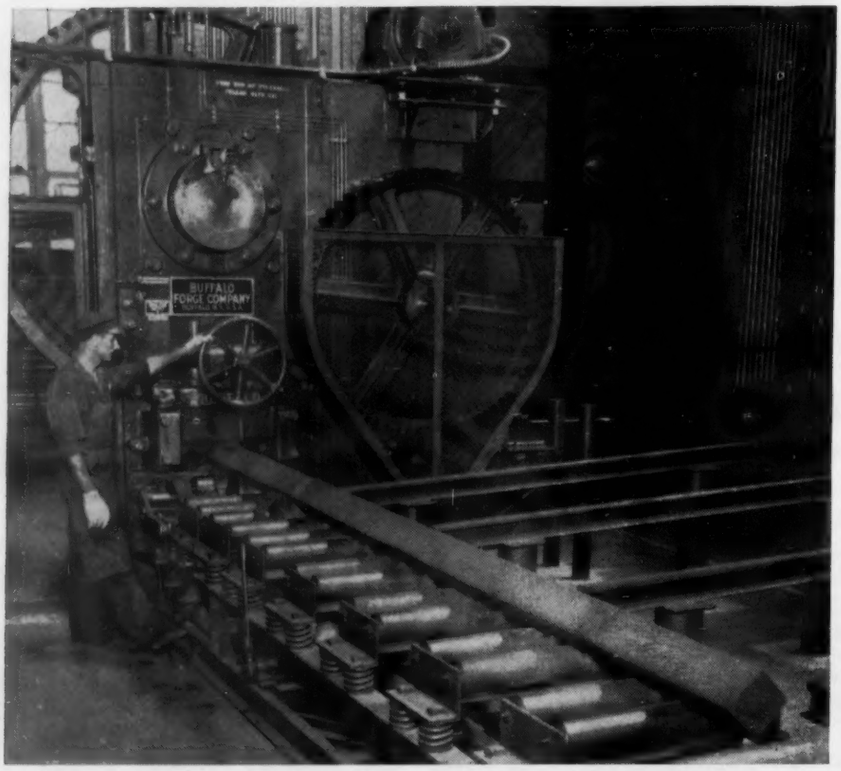
Bunker C oil is used. It burns satisfactorily when heated to approximately 200 degrees Fahr. A 2 pass, 56 tube recuperator, installed parallel with the stack connection, extracts waste heat from hot furnace exhaust gases and makes it possible to pass the gases through or around the recuperator at will. Designed to deliver 5000 cubic feet per minute of air heated to 400 degrees Fahr., the recuperator supplies a large part of the heat requirements of the drier equipment necessary for increased production handled by the furnace.

Recuperator consists of a brick shell, 4 x 5 x 17 feet high, with 56 silicon carbide tubes placed horizontally. Openings at top and bottom provide inlet, outlet and by-pass for the furnace gases going to the stack. Channel and steel plate construction form headers for the tubes.

In operation room, air pulled through the upper half of the tubes to the steel header is reversed to pass through the bottom half of the tubes into a duct which carries the heated air to the drier fan. Hot furnace gases enter the bottom of the recuperator and pass upward around the tubes heating the cool air inside the tubes. At the top a breeching takes furnace gases to the stack.

This rearrangement of the plant and addition of new equipment places this company in a position to turn out 100,000 finished pieces of quality ware a day and makes it one of the leaders in the kitchen cooking utensil field.

Square Bars Handled in Diagonal Position



■ This bar shear conveyor table has been arranged to handle rounds and squares in lengths up to 17 feet and weights to 2000 pounds. A mobile surface is provided by a heavy duty ball bearing rollers, mounted on springs to absorb shock. Table elevation is adjustable by means of screw jacks. Bar stock is fed into the shear by a power-driven, grooved wheel and a guide roller. Photograph courtesy Mathews Conveyer Co., Ellwood City, Pa.

Increases Field for Wrinkle Applications

■ Recent tests by New Wrinkle Inc., Dayton, O., indicate wrinkle finishes deserve more recognition in the field of low temperature drying. Such items as safes with large surface areas and good furniture are not subjected to intense oven heat for obvious reasons. However a wrinkle finish dried under a hot air blast at 150 degrees Fahr. on chairs and office furniture shows excellent resistance to scuffing due to its extreme toughness and durability.

Welded Barge

Details of design and construction of an outstanding all-welded steel fabrication are presented here. Unit, largely shop welded, has large proportion of welds made in downhand position. Use of wide plates reduces number of joints

By J. T. DALCHER
Consulting Engineer
New York

■ TO PRODUCE an economical structural design, the following features should be embodied: Suitability for the work it is designed to perform, sound structural design, economy in its welding technique, attractive first cost and economy in operation. The welded barge described here was developed with the intention of fulfilling these conditions.

The design calls for an all-welded steel barge, of 1000 tons capacity and of sufficiently rugged construction to withstand the rough handling to which such barges are subjected. The design has been reduced to the simplest form. Wide plates, now readily available, are used wherever possible to reduce the number of joints.

Designed to meet the rules and regulations of the American Bureau of shipping, barge has 150-foot length, 40-foot beam with a width over fender of 40 feet, depth amidship of 10½ feet and depth at sides of 10 feet 3 inches. Water tight bulkheads subdivide the barge into 11 compartments, enabling it to stay afloat with one or more compartments flooded.

While a bare deck barge, its construction lends itself readily to carrying cargo below decks by the addition of a cargo hatch in the deck and floor of center compartments. Deck house, railings, deck bulkheads, etc., are usually supplied to meet each individual owners own ideas. Barge also can carry liquid cargo below decks, or dry cargo on deck and liquid below.

Accompanying drawings show general outline and important design features of the barge. Fig. 1 shows arrangement of deck barge; Fig. 2, transverse sections. Note all parts are fabricated and erected without using erection bolts. This eliminates drilling holes. Suitable dogs and wedges provide for temporary securing of plates and shapes.

Deck fittings such as bitts, chocks, etc., are fabricated from pipes, plates, bars and shapes and welded. In case a number of identical fittings are required, jigs are prepared to make all parts interchangeable, further reducing unit cost.

Welding as here applied is comparatively simple, with overhead welding reduced to a minimum. Members to be joined are all of uniform thickness, and the design as a whole is a simple welded structure that can be manufactured in any small shipyard using standard arc-welding equipment.

All plating, bars and flats are received from the steel mill with edges sheared to size, allowing for the usual mill tolerance as applied to this class of material. All shapes are standard rolled sections.

All steel plating, bottom, sides and deck are assembled in sections by lining up two adjacent plates on suitable blocks in a horizontal position, leaving a uniform gap depending on plate thickness. In case the plates are sheared at the mill with plus tolerances, the sections so spaced will become wider than called for on the plan. In case the tolerance is minus, the sections will be narrower.

Angle stiffener or backing-up member now is positioned over the

This is an abstract from the paper which received the second main award, $2,543.88, in the Watercraft classification of the $200,000 Award Program sponsored by the James F. Lincoln Arc Welding Foundation, Cleveland.

Coaling Station Made Of Welded Alloy Steel

■ Said to be the first all-welded, alloy steel coaling station in service, this unit was built at Easton, Pa., for Lehigh Valley railroad by L. G. Plant, Washington. Station has coal capacity of 125 tons, and additional space is provided for storage of dry sand in a semicircular bin seen on the side of the structure. Mayari R low-alloy, high-strength steel was used in this construction because of its resistance to atmospheric corrosion. Photograph courtesy Bethlehem Steel Co.

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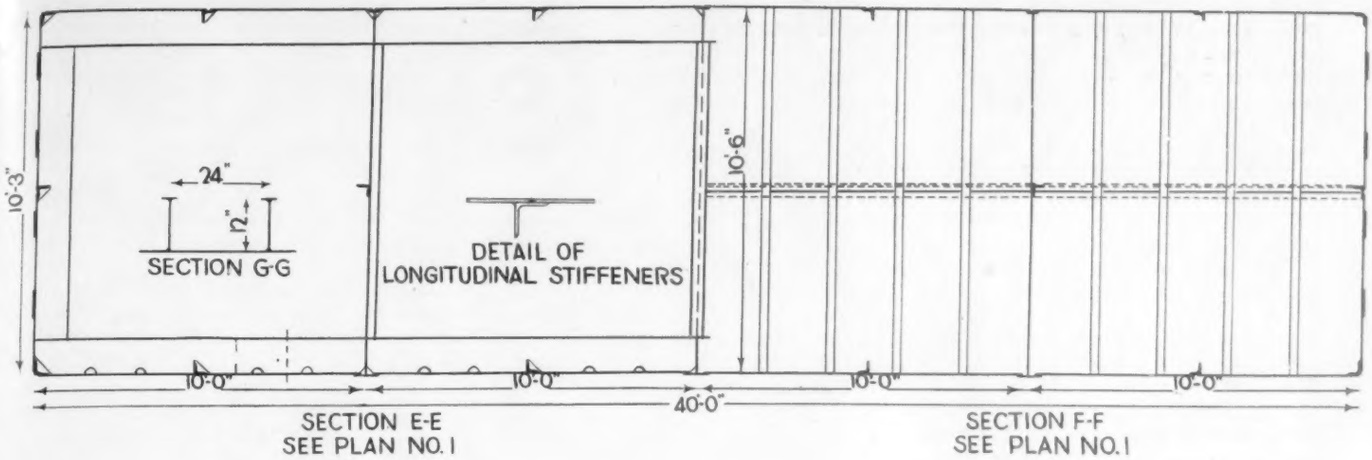


Fig. 2—Details of transverse sections from general sketch, Fig. 1

space between the adjacent plates and tack welded in position, using a 1-inch weld spaced about 24 inches apart and alternating between heel and toe.

The two plates with the angle bar now form one section and are turned over 180 degrees on the blocks, leaving the gap between the two plates on the upper side free for down-welding of the longitudinal water tight seam. With this completely welded, the section is again turned over 180 degrees. Transverse frames are now located in position and tack welded at each end to the section to prevent dislocation, after which the frames are intermittent welded, using a 2-inch weld and 4-inch space, alternating from one side of the frame to the other.

As will be seen from the plans, the construction of sides and deck sections is in all respects similar to that of the bottom sections and the same welding procedure will apply.

The frames consist of hot rolled flats with a strip welded on top to form a T-section. The fillet weld securing strip to flats is intermittent, 2-inch weld with 4-inch space, placed alternately on each side to prevent warping. The frames are notched by gas cutting to clear longitudinal stiffeners. Corners at the ends are cut diagonally to clear corner angles on one side and bulkhead or intercostal girder at the other. Notches and diagonal cuts at the ends also serve as drains for the bottom frames.

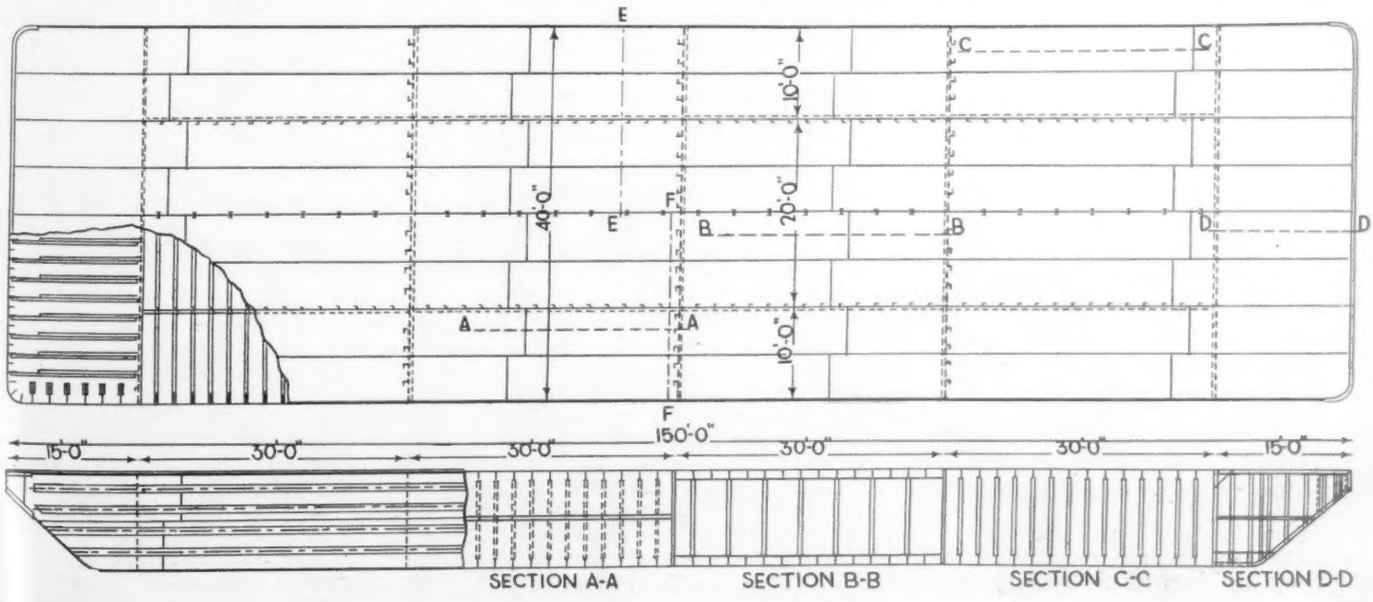
Bulkheads are built of flat plates with horizontal joints backed by an angle bar, similar to the joint described for shell plating. The bulkhead stiffeners, arranged vertically and spaced as shown on plan, consist of angle bars, arranged toe to plating. This position of angle bars affords greater strength as each angle represents a Z-section in conjunction with bulkhead plating.

After being located on the bulkhead sections and while in a horizontal position the angle bars are tack welded at each end to prevent dislocation, after which they are finally secured by intermittent welds, 2-inch weld and 4-inch space, arranged alternately on each side of angle flange. This construction applies to transverse as well as longitudinal bulkheads.

Transverse bulkheads are made up in three sections each. Wing sections are welded to bottom, side, deck and longitudinal bulkhead; the center sections to bottom, deck and longitudinal bulkheads. After being located they are first tack welded in position using 1-inch welds spaced about 3 feet apart. Now they are ready for final welds, either intermittent 2-inch weld and 4-inch space, or continuous welds for water tight bulkheads.

Longitudinal bulkheads preferably are made up in one section to cover the distance between transverse

Fig. 1—General arrangement of deck barge showing sections at several points



bulkheads. The lower edges rest on keel plates, the top edges have a flat bar welded as shown on plan, using intermittent fillet welds in case of non-water-tight bulkheads and full welds in case of water-tight construction. These top bars act as a landing place when deck sections are put in position and as a backing-up member for the longitudinal joints in deck plating.

Intercostal girders located amidship form a continuous member between end transverse bulkheads and consist of flats, the lower one being secured to centerline bilge plate, the upper one carrying a bar on top.

Both girders are welded to bilge plate and top bar, using 2-inch welds and 4-inch spacing, alternating from one side to the other. The bar of top girder acts as a landing place for deck sections and as a backing-up member for the longitudinal joint in the deck plating. Ends of transverse frames, deck and bottom are intermittently welded to girders, 2-inch weld, 4-inch space.

Keel plates are welded to one section of bottom, being first tack welded from the inside with a 1-inch weld spaced about 36 inches apart. Then after section is turned over, a full fillet weld is applied to secure outer edge to bottom plating. Bottom corner angle is similarly welded to end of side bottom section.

Angle bar frames of end section first are assembled with corner, end and bottom brackets secured by intermittent welds. In addition each frame has one vertical and one horizontal angle bar member, secured by intermittent or continuous welds to angle bar frame and bottom brackets respectively.

Frames Positioned

The assembled frames of end sections, spaced as shown on plan, Fig. 3, are first positioned to bottom plating, end transverse bulkhead, deck plating and headlog plate by tack welds with a 1-inch weld spaced about 36 inches. Afterwards the connections are completed by intermittent welds, 2-inch weld and 4-inch space. All angle bar frames are arranged toe to plate for greater strength.

Side frames of end sections, located and spaced as shown on plan, consist of flats with a strip welded on top to form a T-section, similar to main body frames. These side frames are positioned to sides of end sections by 1-inch tack welds spaced about 36 inches apart and afterward intermittently welded to side plating, 2-inch weld and 4-inch space. Single flats, located inway of rounded corners at ends are secured by intermittent welds similar to the other side frames.

Shop welding now being completed, the various sections of the barge are transported to the launching ways and erected. As each section is located, welding operations proceed in the following sequence:

With end section of bottom placed in position, the side section is erected and temporarily shored. In this position, bottom corner angle is first tackwelded on the inside to side plate. Afterwards the bottom end of side plate is welded to angle on the outside by a continuous fillet weld. In addition, flat of side frame is welded to bar of bottom frame by 2-inch intermittent welds spaced 4 inches apart. This makes each frame a continuous rectangular member consisting of bottom, two sides and deck frame.

Welded to Keel

Other end of bottom section, with one end of keel plate already welded, receives the longitudinal bulkhead section which is welded to keel plate by a continuous fillet weld. End section of frame also is welded to bulkhead by intermittent welds.

Inside bottom section next is put in position, the end plate tackwelded to keel plate from the inside and afterwards the edge of keel plate is welded to bottom plate on the outside, using a full continuous fillet weld. The frames of this bottom section are intermittently welded to longitudinal bulkhead on one end and to the intercostal girder at the other.

After deck section has been hoisted in position and landed on top corner angle of side section and bar of longitudinal bulkhead, the deck plating is tack welded to toe of top corner angle from the inside. Afterwards the edge of deck plate is fully welded to top corner angle by a continuous fillet weld on the outside. The other end of this deck section is first tackwelded to edge of bar of longitudinal bulkhead from the inside. The outside full continuous weld is applied after the next adjacent deck section has been tackwelded to the other side of bar of longitudinal bulkhead. Ends of frames of end deck section are intermittently welded to side plating and longitudinal bulkhead respectively. All other sections of the barge are progressively welded together in the manner described above.

The "H" columns, located as shown on plan in way of intercostal girders, are welded to bars of frames top and bottom by a continuous weld, 5 inches long, on both sides of column.

Transverse joints of shell plating, located as shown on plan, are fitted with a backing strip, 3 inches wide, ¼-inch thick. These strips are tackwelded to inside of bottoms, sides and deck plating, using a 2-inch weld spaced above 18 inches. The gap between plate edges is the same width as that of the corresponding shell plating. The strength weld, applied from the outside, consists of two fillet welds and one covering weld.

After each fillet weld has been completed and before covering weld is applied, it will be necessary to peen thoroughly each weld to reduce shrinkage stresses to a minimum. It may also be desirable to heat the plates about 2 feet back of transverse joints to distribute localized stresses in plate welds after welding is completed. For the same reason transverse joints of plates should be left to cool thoroughly before another seam is welded in the vicinity.

Corner angles at headlogs, both top and bottom, after being fitted in position are secured by the usual tack welds, after which the two flanges are welded by a continuous fillet weld. The two short keel plates at the bottom of each barge end after being fitted and tack welded are welded to bottom plates by a continuous fillet weld on both sides.

Fender plates next are located at each side of barge by 1-inch tack welds about 4 feet apart. Then top and bottom edges are welded to barge sides by a continuous fillet weld. Joints in fender plates are made like joints of longitudinal shell plates.

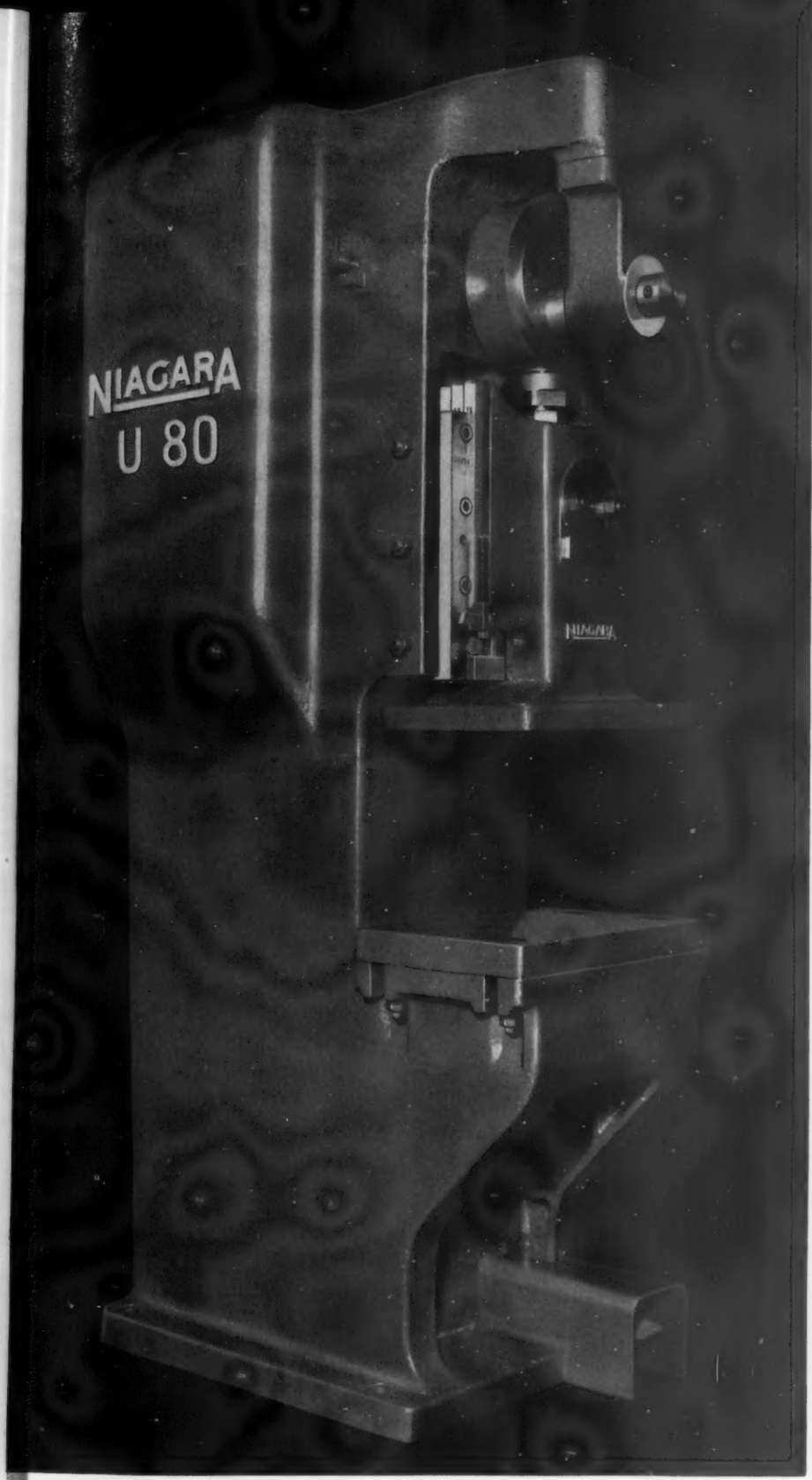
All dock fittings are welded to the dock by continuous fillet welds. All watertight seams are tested by filling the compartments with water or by the application of a water stream with a nozzle pressure of not less than 60 pounds per square inch. Any welds showing leaks or localized cracks are removed by chipping and the section rewelded.

After barge has been tested and approved, all interior and exterior surfaces are wire brushed thoroughly and given one coat of red lead. A second coat is applied in the interior and one or more color coats to the exterior.

Compound Protects Metal Parts Against Rusting

■ Developed for rust protection of metal parts and manufactured steel articles, a waterproof, tenacious, paste-like compound has been announced by D. C. Cooper Co., 20 East Eighteenth street, Chicago.

In applying this rust preventative, the pasty compound is heated to a liquid state and article to be protected is completely immersed. Or the compound may be cut back with gasoline, kerosene, naphtha or any other petroleum solvent to a brushing or spraying consistency. Service to which article is to be put determines consistency. It is said this rust preventative will not become rancid or oxidize after solvent has evaporated.



Niagara Series "U" Streamline Punch Press with integral bed. Series "UA" also available without bed, or with bed bolted in one of several fixed positions, or with mechanism for vertical adjustment of bed. Built in a complete range of sizes.

New NIAGARA *Streamlined* PUNCH PRESSES

The many new and exclusive improvements built into Niagara Series "U" and "UA" Streamlined Punch Presses are of more far reaching importance than simply improved appearance.

Steel Casting Frame not only provides strength and rigidity to maintain alignment of all working parts, but provides a completely enclosed housing for shafts, gearing, fly-wheel and motor. Clutch, all gears, and anti-friction bearings operate in oil. All gears are supported between bearings.

Patented Niagara 14 point Sleeve Clutch with built-in single stroke mechanism provides instant engagement, more strokes per hour and utmost safety.

Slide operates in adjustable, multiple "V" gibs.

Compact streamline design makes it possible to locate presses close together in production lines.

WRITE FOR BULLETIN 60-C

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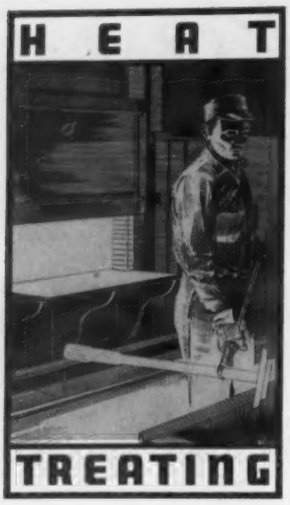


Controlled Work Hardening

Increased hardness and resistance to wear are incorporated into railroad track equipment by a method which depends on the ability of austenitic manganese steel to harden under impact. Process has wide range of application

By R. A. PROSSER
Ass't. Metallurgist
American Manganese Steel Div.,
The American Brake Shoe &
Foundry Co.
Chicago Heights, Ill.

■ MODERN railroad traffic with its higher speeds and heavier loads has necessitated improvements in railroad tracks, a typical example of which is the depth hardened crossing recently introduced by American Manganese Steel division of The American Brake Shoe & Foundry Co., Chicago Heights, Ill.

Original crossings made of 10 to 14 per cent manganese steel, having an austenitic metal structure, enabled these members to resist high impact and abrasion. However, when higher speeds and heavier traffic became common, foundry engineers faced a difficult problem, for a heavier crossing based on old designs tended to flow and pound down excessively on the receiving surfaces.

One expedient adopted was to cast pads on the corners of a crossing. These then were hammered down to surface level before installation. This cold working of metal prior to installation tended to forestall flowing in service. However, observation of crossings and tracks in service sometimes indicated unsound metal under the surface.

X-ray examinations showed that even a light reinforcement in the box-like section under the points and flangeways had a tendency to produce shrinkage cavities; and yet ribs or other supporting members were necessary to prevent fatigue cracks from repeated flexing of the castings under passing trains. It appeared that proper strength could only be attained at the expense of proper wear or resistance to flexing.

Finally the problem was solved by eliminating ribs entirely from the casting, leaving it in the form of inverted channels, thus allowing equalized metal sections throughout the piece. Radiographs indicated that a principal cause of unsound metal had been eliminated.

It then was feasible to weld in a special supporting member underneath the unit as shown in accompanying illustrations. This protects the casting while undergoing hammering during the work-hardening procedure. The reinforcement also forms a permanent flangeway support. The new Amsco depth-hardened crossing is made as follows: Starting with a sound casting having tapered pads cast on the receiving surfaces as shown in Fig. 2, the first step is heat treating. This is done carefully to retain the austenitic metal structure of the 13 per cent manganese steel.

Depth Hardening Reduces Flow

After a preliminary rough grinding operation and the welding-in of the supporting grid, the crossing is depth hardened. This process was developed by the American Manganese Steel division of The American Brake Shoe and Foundry Co. to eliminate the excessive flow under the traffic which takes place in unhammered manganese steel crossings. Depth hardening consists of cold working the points of crossings to a degree approximately equal to the maximum flow encountered in actual service.

The extent of deformation of a large number of ordinary manga-

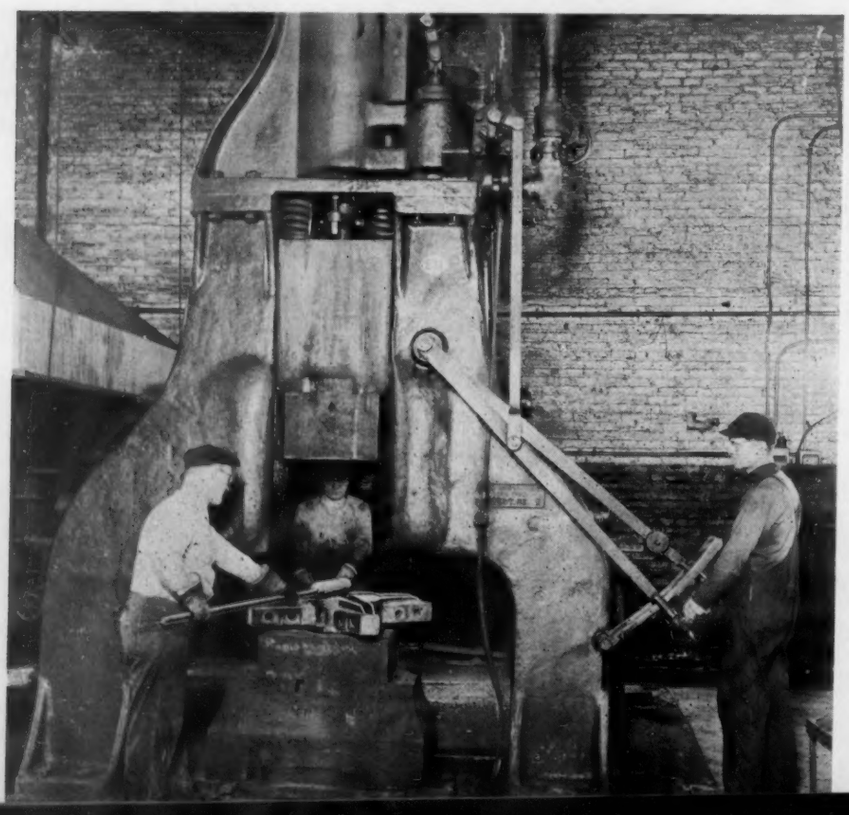
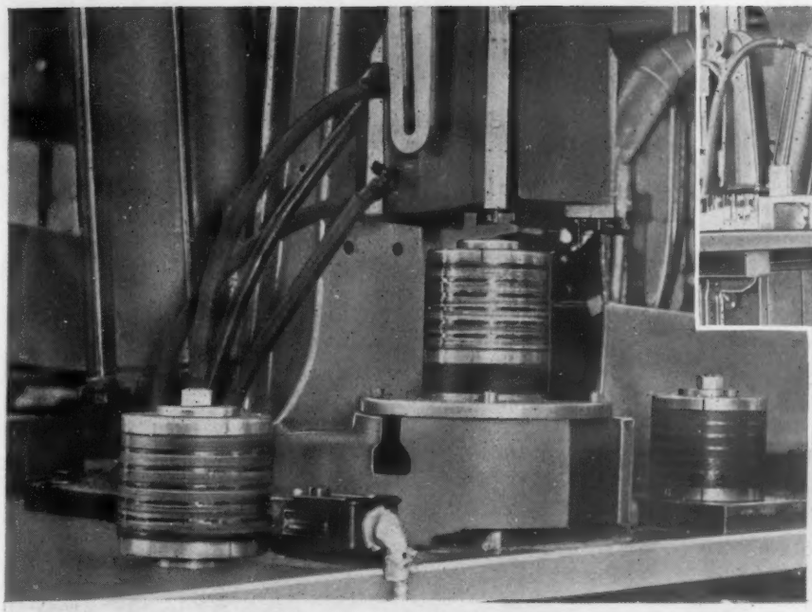


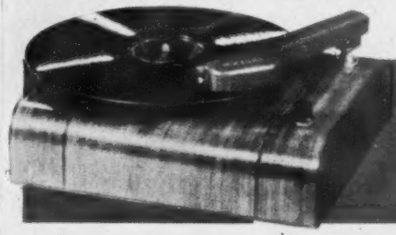
Fig. 1—During the work-hardening process, a round tool is used as shown here



Six rotors for Victor Record Players, made up of laminations covered with glue and assembled on one spindle, are heated and pressed in three minutes and forty seconds.

The entire assembly and heating operation is performed on one bench, with the Ajax-Northrup Converter and Controls located underneath.

Stepping Up Production of the



RCA Victor RECORD PLAYER

Formerly only 600 — now 6000 laminated rotors per day! That is the story of high frequency induction heating with Ajax-Northrup Heating Coils applied to the production of the RCA Victor Record Player.

Results: 12 rivets eliminated; diameter reduced one inch; area reduced 30%; 12 laminations replace 16; 48% of weight saved; assemblies more accurate; saved hobbing and broaching teeth; reduced cost of motor more than half and increased production 1000% per 24 hour day.

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Non-ferrous Ingot Metal for foundry use.

Ajax Electric Furnace Corporation
Ajax-Wyatt Induction Furnaces for melting.

Ajax Electric Co., Inc.
Ajax-Hultgren Salt Bath Furnace and Resistance Type Electric Furnaces for all heat treating operations.

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Somewhere there is a production operation involving heat applied to or near metallic parts. You may need heat for forging, brazing or upsetting, or only heat enough to glue or soften the materials during the operation. If you have such a situation, you can expect a revolutionary improvement —in the quality, quantity, control, space required and cost per job.

High frequency heating is so new that we cannot anticipate its possibilities. If you will tell us what your heating problems are, our engineers will tell you what you can save.

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nese steel crossings was carefully measured. Additional material comparable to this amount of flow is added to the crossing point in the form of pads, cast integral with the casting. These pads, Fig. 2, follow the flangeways for about 6 inches back from the crossing points and are approximately ⅜-inch high at the point, tapering off to the casting surface in 6 inches.

Depth hardening is completed in three steps: First operation is to grind away 1/16-inch from the surface of the hammering pad and from the vertical sidewalls of the flangeways immediately adjacent to the pads. This is to insure the removal of all decarburized metal.

Second, the actual cold work hardening is accomplished by causing the excess pad metal to flow toward the flangeways and to the point. This is done by using a special steel tool, 3⅜ inches in diameter and approximately 8½ inches long, mounted on the end of a handle and manipulated by an operator as shown in Fig. 1. A steam hammer is used capable of delivering a blow of approximately 4000 foot pounds.

The casting is set on the anvil of the steam hammer with the casting adequately supported. The tool is placed at an angle of approximately 30 degrees to gage line of the point at the thin edge of the pad. With each succeeding blow, the tool is worked progressively toward the gage line, rolling the excess metal ahead of it.

Next, the tool is placed at the opposite side of the pad, making approximately the same angle with the second gage line. Then it is worked progressively toward the gage line. After this, the tool is placed at the back edge of the pad in such a manner that it makes approximately the same angle with each gage line. Then it is worked progressively toward the point. The intensity of the hammer blow is proportionally decreased from 4000 foot pounds as the length of the line

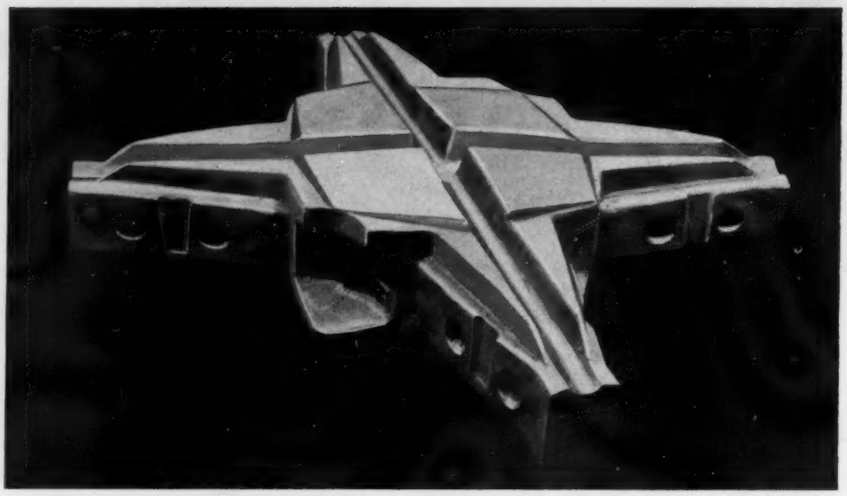


Fig. 2—This shows extra metal cast on top of surfaces. This metal will be worked down level with normal top surface during the work-hardening process

of contact of the tool decreases. This prevents damaging the point of the crossing. Hammering is continued until the raised pads have been made flush with the normal running surface of the casting.

After the hammering operation is complete, the casting will show a bulge or flow into the flangeways approximately 3/16-inch wide by ¾-inch deep. Also, it runs along with the flangeways approximately the same length as the pads. The surface hardness taken along a line parallel to and 1 inch from the gage line ranges between 325 and 400 points brinell.

The third and last step consists in removing the excess metal caused by hammering. This is followed by pressing the casting free from any bowing or warping that may have resulted during the process. Completion of the crossing unit involves final grinding, shop assembly for fit, and inspection. See Fig. 3 for completed unit.

Advantages of the depth hardening process are that it minimizes maintenance of crossings themselves while in tracks, and lessens shock to rolling equipment with resulting savings in repairs. These new depth hardened crossings have shown remarkable results in service. At the intersection of the Indiana Harbor Belt railroad with the Chicago & Western Indiana railroad at Dolton, Ill., they carry about 94 trains per day and after 8 months of service show wear of only 1/64 to ⅛-inch. At the intersection of Chicago & Northwestern railway's main line with Chicago & Northwestern railway's freight line at Des Plaines, Ill., the traffic amounts to about 50 trains per day. After 9 months' service here, the wear ranged from 1/64 to ⅛-inch. At the intersection of Alton & Southern railroad with the Nickel Plate road at Madison County, Ill., 42 trains per day pass, and crossings here show only 1/32 to 5/32-inch wear after 16 months.

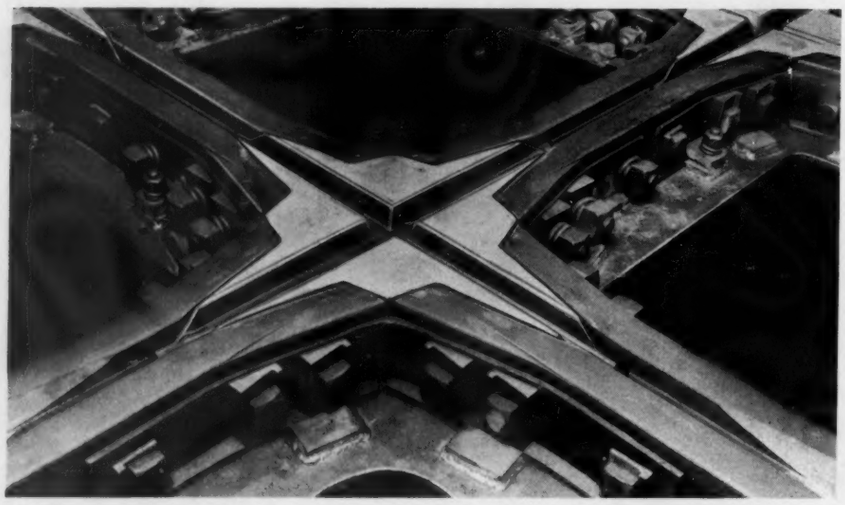


Fig. 3—Complete crossing assembly after heat treatment, work hardening, finish grinding and assembly into track

Reaffirms Metal Lath Simplified Practice Lists

■ The division of simplified practice of the national bureau of standards, Washington, has announced that simplified practice recommendation R3-36, metal lath, has been reaffirmed without change by the standing committee of the industry.

This simplification program lists the weights of stock types, of flat, flat rib, ⅜-inch rib, ¾-inch rib expanded metal lath, and of sheet lath. When it first went into effect in 1924, the recommendation effected a variety reduction of 101 items reducing the items listed as stock by the manufacturers from 125 to 24. It was revised in 1928, reaffirmed in 1935, and revised again in 1936.

Seek Methods To Increase Sales Of Gas Fuel in Industrial Field

(*Concluded from Page* 33)

mains high over a longer period of time.

From the safety angle, the boilers and heaters are equipped with high-grade safety devices, Mr. Sellers asserted. Furthermore, the CO content in the flue products is carried to a point below the A. G. A. requirement, thus eliminating danger from this angle. Advantages of immersion units, the speaker stated, are compactness, ease of installation at point where steam and hot water are required, and maintaining of uniform temperature.

Gas Fired Boilers

Advantages of Dowtherm boilers fired by gas were enumerated by D. A. Campbell and E. E. Magnuson, Eclipse Fuel Engineering Co., Rockford, Ill. Boilers operating on this principle are particularly suitable for processes requiring rapid heat transfer, uniformity of heating, freedom from fire hazards, close temperature control, and temperatures ranging from 300 to 650 degrees Fahr.

Diphenyl-diphenyloxide, or Dowtherm, is an amber liquid, which when heated forms a vapor. This vapor carries latent heat and upon being cooled condenses liberating a tremendous amount of heat. That steam is an ideal heat transfer medium has long been demonstrated. Dowtherm vapor to all intents and purposes is steam but in a higher temperature range, and will give high temperatures at low pressures. For the latter reason, the authors explained, the boiler solves many difficult high-temperature applications. Furthermore, the vapor temperature at a given pressure is always the same, so by controlling the pressure of the vapor its temperature is also controlled.

These boilers are being used for many special heating applications, for example, laboratory autoclaves; core oil kettles; asphalt kettles; varnish kettles; paper rolls. In some installations, the job can be done better by circulating hot Dowtherm liquid to produce temperatures not over 350 degrees Fahr. Among the applications of liquid phase heating are automatic injection plastic molding presses, asphalt tanks, paper mill machinery, and wall board manufacturing equipment.

Recirculating air heating for gas-fired industrial furnaces was described by Edward Stephenson Jr., Surface Combustion Corp., Detroit. These furnaces, of recent origin, take advantage of the basic principle that the movement of large volumes of heated gases around objects to be heated results in heat transmission at rates, and with degrees of uniformity, hitherto unknown.

Masses of hot gasses are forced to flow around and over the materials, including steel parts or intricate assembles of ferrous and nonferrous metals. These gases are forced around in a closed system, some means is provided to move them mechanically, some means to heat, and some means to control the absorption of heat by the products in the furnace chamber.

According to Mr. Stephenson, furnace structures are of steel and for the most part are portable. All forms of linings are employed, dependent upon temperature, expected life and capitol investment. Various forms of conveying mechanisms are used, including woven wire belt, articulated link belt, apron conveyor, pen pusher, shoe pusher, roller hearth, walking beam, overhead or under chain. A good heater is one which has minimum storage, that is the amount of heat to bring the heater to temperature is at a minimum. Burners are selected to do the job properly and efficiently. Fans force the air around and temperature of the air is regulated by a control system.

Luminous Flame Applications

Luminous flame and its application on furnaces was discussed by J. E. Dare, Public Service Co. of Northern Illinois, Streator, Ill. This type of flame is obtained by admitting little or no primary air to the burner, and by controlling the velocity of air and gas streams or speed of mixing, the length of flame as well as luminosity can be controlled within desired limits.

Presence of a great number of glowing or incandescent carbon particles in the gas stream increases the radiation from the flame to the work or rate of heat transfer. At the higher temperatures, the radiation power of a luminous flame is about 4 to 6 times as great as a non-luminous flame of the same temperature.

Advantages of luminous flame heating were cited by Mr. Dare as: An increased rate of heat transfer; more uniform temperature control; less maintenance of refractories; greater degree of turn down of burners; and formation of scale which requires much less trouble to remove as well as reduction in the amount of scale.

Successful applications of luminous flame combustion in the steel industry include: Heating stock for rolling mill work; heating stock for forging work; soaking pits; open hearth melting; heating for annealing, normalizing and hardening; side firing of galvanizing pots; and miscellaneous high temperature processing.

The matter of producing non-oxidizing or reducing atmospheres within furnaces treating ferrous and nonferrous metals. To this end, the American Gas association testing laboratories, Cleveland, have been and are studying the nature of these atmospheres and the methods by which they can be produced by combustion of industrial gas. A progress report on work so far completed was presented by L. O. Howell, industrial engineer with the laboratory.

Flue Gas Oxidizes Steel

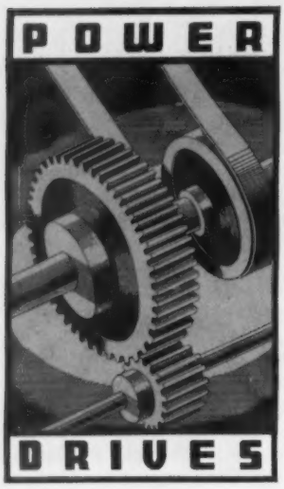
It was pointed out that CO_2 found in the flue gases obtained by burning coke oven gas with 60 per cent of the air required for combustion will oxidize steel at all temperatures considered. A nonoxidizing condition can be obtained only by fixing the flue gases at a high temperature and removing the water vapor. This removal of water vapor is one of the essential operations of some of the atmosphere machines now on the market.

Present status of prepared atmospheres in industrial heating was reviewed by B. W. Gonser, Battelle Memorial institute, Columbus, O. In the case of medium carbon steels, the important matter is to remove CO_2 in the atmosphere. Frequently it is necessary to protect steel and other metals which must be treated in gas-fired furnaces not equipped for atmosphere control, and for this, the speaker suggested applying some suitable mechanical coating to the parts.

Gas heated equipment is admirably suited to the drying or baking or lacquers, japan and other metal finishes, stated P. J. Ziegelbaur, Pontiac Varnish Co., Pontiac, Mich. He predicted that drying time would be speeded up in the future by development of quicker-drying finishes.

Offering advice on how to get the most from outside sales aids, W. H. Eisenman, secretary, American Society for Metals, Cleveland, established three principles: (1) Keep customers satisfied with their service and equipment; (2) advertise service and equipment adequately; and (3) attend and participate in conventions and expositions.

F. H. Trembly Jr., Philadelphia Gas Works Co., Philadelphia, is chairman of the industrial gas section, American Gas association; F. T. Aainey, Ohio Fuel Gas Co., Columbus, O., is vice chairman; and E. D. Milner, American Gas association, New York, is secretary.



Mill Drive Problems

How several rather unusual drive problems were solved effectively by use of newly developed equipment is detailed. Alternating current motors find wider application

By CHARLES P. CROCO
Steel Mill Engineer
Westinghouse Elec. & Mfg. Co.
East Pittsburgh, Pa.

■ A STEEL fabricating company decided to install a welder for welding seams in tanks. This required that a gantry crane be supplied to carry the welding head over the tank. Both sides of this crane had to be driven, but to gear them together would require approximately 20 feet rise, across 20 feet, and down 20 feet, with much shafting and bevel gearing. In addition, the drive required a speed range of 12 to 1. While only a small amount of power had to be transmitted, the cost of gearing and shafting seemed high.

It was decided to use a 5 horsepower, alternating current motor to drive both sides and to use a variable speed transmission to obtain the 12-to-1 speed range. The low speed shaft of this transmission unit was geared down to the drive wheel on one side, through approximately 3000-to-1 gearing. But instead of using bevel gears and shafting to drive the other side, a synchro-tie was used. The transmitter was connected to the variable speed transmission. The receiver was then connected through an identical gear train to the drive wheel on the other side of the gantry crane. Thus the two sides were driven in synchronism with the only tie between the two legs being the electric wiring.

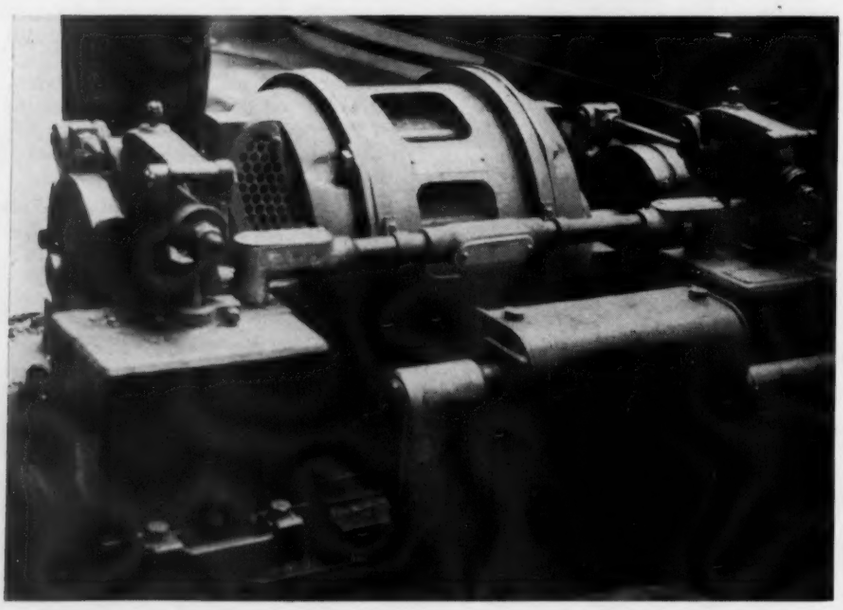
For years the use of alternating current power for steel mill auxiliaries was limited to such constant speed drives as pumps and fans. Almost all of the rest of the steel mill auxiliary drives, such as those that required frequent starting and stopping or those that were of such a nature as to require adjustable speed drives, were almost invariably driven by direct current motors.

In the last few years, improvements in the design of constant speed and multispeed squirrel cage induction motors, such as low inrush and high starting torque, have given the application engineer a new tool to solve many problems that could formerly be solved only with direct current motors. Not only the better operating characteristics of the alternating current motors, but the material savings in first cost, have led to the use of such motors in a number of interesting industrial applications.

Replaces Direct Current Motor

For years the tong carriage on tube or rod draw benches has been returned by hand on the smaller benches, or by the use of a direct current motor on the larger benches. The carriage return drive motor was furnished with a dynamic-braking controller and a magnetic brake for accurate stopping at the die block. More for the big saving in first cost than for any improvement in operation, an alternating current motor was applied to the tong carriage return of an existing draw bench. This was a single speed motor and stops were made with a magnetic brake mechanism.

With the brake adjusted correctly, extremely accurate stops could be made, but since no dynamic braking could be used conveniently, brake wear was more than on a corresponding direct current drive. The next carriage return drive to use an alternating current motor therefore was furnished with a 2-speed, alternating current motor. The carriage then was returned at high speed until near the die block where a limit switch automatically transferred it to the low speed. The final stop was



Alternating current motor used with two magnetic brakes and a cam limit switch on a cropping shear

Have You Seen This HELPFUL LITERATURE?

Here are the latest industrial publications reviewed for your benefit. They are yours for the asking. There is no charge or obligation. Simply fill in the convenient coupon and return.

(1)—Precision Lathe

The Monarch Machine Tool Co.—32 page illustrated, plastic bound bulletin No. 183. A new 10 in. by 20 in. sensitive precision lathe performing all the functions of larger lathes is announced. Full page photographs show this unit from every angle and fully descriptive information on engineering and operating features and complete specifications are given.

(2)—Temperature Control

The Foxboro Co.—48 page illustrated bulletin No. 225. Factors governing the choice of temperature controllers and outlines of the types of air-operated controllers for industrial needs are discussed. Cut-away views and schematic drawings show construction features. The four classes of thermal systems are discussed. Engineering data are provided.

(3)—Disc Brake

Stearns Magnetic Manufacturing Co.—Illustrated loose leaf bulletin No. 650. Style "DM" magnetic disc brake, actuated by a magnet is described. Sectional illustrations and dimensional tables provide full information.

(4)—Pylets

The Pyle-National Co.—12-page illustrated bulletin No. 1110. Rectangular pylets for all industrial purposes are fully described. Sizes and types are available for every need. Includes dimensional tables and price list.

(5)—Copper Alloy

A. W. Cadman Manufacturing Co.—8 page illustrated bulletin on Cupaloy. This new copper alloy is said to be as strong and hard as steel and particularly applicable where high physical stresses and heavy electrical current are present. Physical properties are described and a table of applications is given.

(6)—Salt Bath Furnace

Ajax Electric Co., Inc.—12 page illustrated catalog No. 106. Ajax-Hultgren electric salt bath furnaces for cyanide hardening, liquid carburizing, hardening in neutral bath, selective hardening and annealing, tempering, hardening high speed steel tools, annealing and age hardening are fully described. Specifications of standard sizes are given.

(7)—Precision Grinders

The Dumore Co. — 26 page illustrated 1939 catalog. Full descriptions and specifications of hand and bench precision grinders are given. Numerous pictures of these units in operation are shown. Utility tools and accessories are also covered.

(8)—Welding Positioner

Cullen-Friestedt Co.—4 page illustrated bulletin WP-17. Fully adjustable, specially designed table for holding units for welding. Capacity up to 2500 pounds. Either manual or electric motor driven. Reduces welding costs.

(9)—Materials Handling

Mathews Conveyer Co.—32 page, case bound, illustrated book "Natural Laws Applied to Production." The history of materials handling and industry's development of processes is presented in narrative form. The second part of the book shows numerous industrial applications of Mathews conveyors and conveyor layouts.

(10)—Industrial Furnaces

Barkling Fuel Engineering Co.—60 page illustrated catalog No. 105. Explains the "Econotherm principle" used in design of Barkling industrial furnaces. Heating up time and fuel consumption are claimed to be reduced and more constant temperatures are attained. Other types of furnaces and quenching and washing equipment are also described.

(11)—Scales

Streeter-Amet Co. — Multi-page, loose leaf type illustrated folder. Full descriptive information of heavy duty and automatic scales for all types of industrial demands, together with capacity tables and dial and record keeping mechanisms are given.

(12)—Carbide Alloy

Metal Carbides Corp.—4 page illustrated bulletin. Describes a new tungsten carbide alloy for greater wear-resistance. Increased toughness and freedom from size limitations are major advantages. Application information is given.

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HELPFUL LITERATURE

(13)—Centrifugal Pumps

Worthington Pump and Machinery Co.—Illustrated bulletin No. W-319-B1A. Describes high-pressure, forged-steel-casing, centrifugal pumps, for application to high pressure steam generating units. Several installation views, together with a list of important installations and conditions of service are included.

(14)—Rust Preventive

The Stop-Rust Co.—8 page bulletin describing "Stop-Rust." Three grades of this product are available for rust-proofing ferrous material in storage and in production. Also used for protection of plant equipment and tools. It is not a petroleum base product and is easily applied by several methods.

(15)—Paint

Harrington Paint Co.—6-page folder on "Glymmer", a paint for rough handling with high weather and chemical resistance, for steel. Heat resistance, inorganic acid and alkali proof, anti-corrosive, waterproof and overnight air drying, are a few of the characteristics claimed for this paint. Has about twice the coverage of red lead, and requires no primer.

(16)—Turret Lathes

Gisholt Machine Co.—12 page illustrated catalog No. 1073. Fully describes Gisholt 1L, 2L and 3L high production turret lathes. The 3L model is a new addition to this line, and is of greater capacity. Detail photographs and full specifications are included.

(17)—Ground Rod

Anaconda Wire and Cable Co.—20 page illustrated, fourth edition, publication No. C-14. Anaconda star ground rod and Everdur ground wire clamps for electrical grounding are fully described. Recommended methods of grounding, and full discussions of ground characteristics are included.

(18)—Bearing Bronze

Johnson Bronze Co.—72 page illustrated, thumb-indexed catalog No. 390. A comprehensive guide with progressive size listing of general purpose bearings, in 800 sizes, machine finished ready for assembly; over 350 sizes of Universal bronze cored and solid bars; over 230 sizes of electric motor service bearings and full information on lead-base and tin-base babbitt, cast bronze graphited bearings and plug type bearings.

(19)—Thermometers

C. J. Tagliabue Mfg. Co.—16-page illustrated catalog No. 1170. "Tag" dial-indicating thermometers for industrial applications in numerous styles are described. Specifications and standard dial ranges are shown. Contact alarms and auxiliary equipment are also described.

(20)—Hose

The De Vilbiss Co.—24-page illustrated catalog No. HD. This booklet takes the reader through the plant and describes each step in the manufacture of hose. Specifications are listed for each type of hose, and information for selecting hose for various uses are given. Accessories are also described.

(21)—Car Pullers

Stephens-Adamson Manufacturing Co.—8 page illustrated catalog No. 7738. Gives specifications, dimensions and required engineering information on how to select proper car pullers for various applications. Accessory equipment and hand and motor driven winches are also covered.

(22)—Rod Straightener

The American Foundry Equipment Co.—8-page illustrated bulletin No. 10. Construction, operating data and specifications of rod straighteners handling work from ⅜-inch to 2½ inches in diameter, and for shearing rods from ⅜ to 1½ inches in diameter, are given.

(23)—Industrial Trucks

Clark Tructractor Div.—8 page illustrated double-fold booklet. The Clark Carloader method of materials handling is fully explained and described. Numerous shop photos and schematic drawings illustrate advantages of this type of handling unit. Performance data are included.

(24)—Motor Chart

The Louis Allis Co.—4-page illustrated bulletin No. 515. Handy motor application chart lists 26 different types of motors and checks the proper type of motor recommended for about 50 standard applications. Also analyzes starting, maximum and full load torque characteristics, speed regulation and other information.

(25)—Safety Cut-Out

Anchor Steel and Conveyor Co.—4-page illustrated bulletin No. 39-1. Announces a new automatic overload safety cut-out for power drive protection. Elimination of shear pins saves time and labor. Can be installed on pulley, silent chain sprocket, roller chain sprocket, V-belt sheave or gear.

(26)—Temperature Indicators

Leeds & Northrup Co.—4-page illustrated catalog No. N-33A(5). A new switchboard model, temperature indicator with self-contained switches for connecting any one of a number of couples to the measuring circuit is announced and described. Portable and table models are also described.

(27)—Drill Jig Bushings

Ex-Cell-O Corp.—8 page illustrated bulletin No. 11881. Prepared especially for designers, with full data available in easy-to-use form. Printed on heavy cardboard for service. Headless press fit bushings, headless liners, fixed renewable bushings and head press fit bushings are covered and priced.

(28)—Speed Lathe

Schauer Machine Co.—16 page illustrated bulletin No. 380. The Ideal speed lathe is designed especially for finishing, polishing, burring or lapping small parts. Specifications and full descriptive information are included.

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made by applying the magnetic brake at the low speed. This resulted in less brake wear and much more accurate stops without sacrificing any of the high speed return.

The first motor was a 3 horsepower, 1150 revoluion per minute, 3 phase, 60 cycle, squirrel cage, induction motor, but on later drives the motors were either 1½/3 horsepower, or 2½/5 horsepower, at 575/1150 revolutions per minute.

Successful use of alternating current, 2 speed motors on the carriage return drive led to the use of this type of motor for the main drive of a tube draw bench. While alternating current motors had been satisfactory for the driving of low speed tube draw benches, with increased speeds it was difficult to catch the point with tongs without breaking it. Direct current motors had been used for this purpose. The motor was run at base speed until the draw had been started. Speed then was increased to a predetermined drawing speed. This equipment was much more expensive so it was decided to try a 2 speed, alternating current motor for the main drive. A 37½/75 horsepower, 2 speed motor was used. In order to obtain continuous torque during transfer from low to high speed, a two winding, two speed type of motor was employed. By bringing out both ends of each phase of both windings, a closed transient was obtained.

Still a further use of alternating current in replacing direct current motors has been in the cropping shear. After considering both the inertia of the shear and the motor, the number of cuts to be made per minute, and the actual shearing load, a motor having 160 pound-feet starting torque and a synchronous speed of 600 revolutions per minute was selected. Since it was necessary to make accurate stops, after considering both the inertia and the rating of the magnetic brakes available, it was decided to use two brakes.

While every day brings the application engineer new problems to be solved, it is often only an old problem presented from a new point of view. The improvement in design of equipment, together with the development of new types, is always opening new and unusual methods of solving these problems.

♦

Guide to Tariff Rules Issued by Custom House

■ Custom House Guide, Custom House, New York, has issued its 1939 edition, including the exact wording of each of the 19 reciprocal trade agreement rates of duty and other changes by executive or legislative action under each paragraph affected, in the tariff act of 1930 section.

United States customs regulations have been completely revised in accordance with the customs administrative act of 1938. New rates of duties reflect the United Kingdom, Canadian and all previous reciprocal trade agreements and changes, opposite each of 30,000 commodities. A special section has been added, showing various acts, including import taxes and processing taxes applying to imported merchandise of products derived therefrom. Other sections have been revised to bring them up to date. It is available from the publisher at $15, plus postage.

Demand Charges Are Reduced

■ PARTLY through the help of instruments located about the plant and partly through the co-operation of the Philadelphia Electric Co., Leeds & Northrup Co., Philadelphia is heading off extra demand charges which in the past have cost $2000 a year on a load having normal maximum demand of 350 kilowatts.

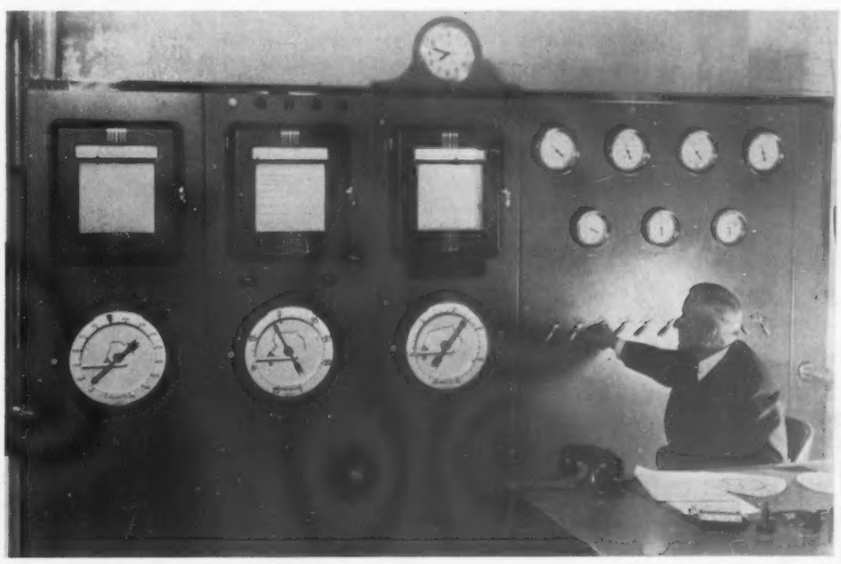
According to W. R. Coley, factory manager, Leeds & Northrup Co., in a recent issue of *Electrical World*, peak demand loads in this plant develop rapidly at irregular hours and may last only a few minutes. This makes it possible to hold the maximum demand interval within contract limits by cutting off part of the connected equipment automatically when a peak is reached.

Beside lighting and induction motor loads, there is considerable electric furnace load. Some of these furnaces can be shut down for several minutes at a time to provide ample over-peak-load reduction. The problem is to study demand under all plant operating conditions and arrange a schedule that shuts down the right furnaces in proper sequence and at the correct points on the load curve. To this end, an instrument panel shown in accompanying illustration has been installed across one wall of the maintenance engineer's office. On it, as shown, are three Micromax round chart recorders for load, for power factor and for voltage.

Load recorder is arranged to show either lighting load, power load or total load as desired. When automatic load control is undertaken, the load recorder becomes the controlling element. Large blocks of non-inductive, unity power factor furnace load cannot be dropped without considering its effect on power factor. The power factor recorder shows effect of such load loss and also the corrective effect of changes that are being made progressively in motor sizes and amount of capacitors in the plant. This instrument shows power factor on either phase of the 2-phase supply, or of total load.

A manual switch permits voltage recorder to show readings from any leg to ground of any power or lighting bank. Since voltage at the buses is affected quite largely by plant load, this instrument has obvious advantages in current-load studies.

If $2000 is saved yearly on excess demand charges, instruments will be paid for in nine months, a return of 133 per cent per year on the investment.



Instruments aid in cutting power costs. Left to right in lower row on first three panels—kilowatts, power factor and voltage Micromax recording instruments. At top are carbon dioxide and smoke density recorders and 16-point temperature recorder

Southern Iron and Steelmaking Reviewed at Birmingham Meeting

(*Continued from Page* 21)

be used the speaker warned. The degree of contamination often influences the choice of a lubricant. Where bath lubrication is employed a low-viscosity lubricant is advisable. The speaker recommended a lime grease for mills equipped with sprays inasmuch as the salt water often is forced into the bearings.

Some high-temperature greases provide normal lubrication; excess heat can be absorbed by the use of a low-viscosity oil. Effective lubrication tends toward a low maintenance cost, the speaker said. Many of the steel companies have maintenance engineers, and inasmuch as they have time to learn the quality and effective use of lubricants he urged that they be given the opportunity to co-operate with producers of lubricants.

The speaker did not recommend expensive lubricants for old style equipment. Red engine oil, he said, is found in most steel mills in two viscosities. It has a medium flash point and is used effectively for plain bearings and large reduction gears.

The time is past, he stated in conclusion, when the equipment manufacturer can build machines without first considering lubricating devices. The effort on the part of the steel producer to make quality material has led to the manufacture of better lubricants which are more economical in the end.

T. R. Moxley, general master mechanic, Wheeling Steel Corp., Steubenville, O., in discussing Mr. Mandy's paper, mentioned that lubrication is the problem of the maintenance man in case there is no lubricating engineer at the plant. He advocated the selection of proper lubrication to perform the proper function. Where greater production is demanded, lubricating problems are more complex, he stated. Abnormal production at old mills would not be possible were it not for oil companies producing better lubricants.

Metallic Bearing Seal

Under high-speed operation the presence of water is causing problems heretofore not encountered. Most mills are designed with a seal on the bearings to retain the lubricant. With a metallic seal only 1 per cent moisture reaches the bearing lubricant compared to 10 to 15 per cent under former practice. Because of condensation in the housing of large gear reduction sets, a lubricant of good densibility is preferred. High-pressure lubricants are costly and their use must be supervised carefully, the speaker pointed out.

Further discussion brought out the fact that while a safe operating temperature for E. P. lubricants should not exceed 225 degrees Fahr. the temperature should be kept as low as possible.

At the dinner in the evening, members and guests were welcomed by Robert Gregg, president, Tennessee Coal, Iron & Railroad Co. Speaking before a capacity audience, Mr. Gregg paid tribute to electrical engineers for the remarkable service rendered to mankind and emphasized that without their help, knowledge, and genius many of the things in the steel industry would be unknown.

Describes Soaking Pits

At the evening session, M. P. Burns, assistant fuel engineer, Tennessee Coal, Iron & Railroad Co., Ensley, Ala., as co-author with E. A. Hawk, fuel engineer of the same company, described the mechanical and electrical phases and the method of operation of new soaking pits installed at the Fairfield works of his company. Efficiencies ranging from 29.8 to 54.8 per cent were recorded in the detailed heat balances. Coke oven gas consumption was reported as averaging 400,000 B.t.u. He cited fuel input as ranging from 12½ million B.t.u. per hour to a holding consumption of 2 million B.t.u. per hour.

Pit temperatures, he explained, are controlled by thermocouples located in the waste-gas stream leaving the furnace, working back to regulate the rate of firing. The fuel-air ratio for each pit is controlled automatically. Flow charts are employed to check this ratio. Automatic regulation of the furnace pressure also is provided. A regulator, which controls a butterfly valve in the main gas supply line, maintains the uniformity in the fuel gas pressure. The movement of the pit cover automatically stops the fan supplying the combustion air while stoppage of the air flow causes the combustion control to shut off the fuel gas supply.

A technically trained man serves as pit operator and is responsible for the operation of all the controls. He also maintains a complete record of pit performance.

The speaker emphasized that the scale formation in the pits is of normal weight but uniform over the entire ingot. It is only necessary to clean out the pits every three to four weeks, fresh coke being added every two days. In conclusion, the author mentioned that the feature of the new automatic pits includes low-fuel consumption and uniform heating.

Controlled heating of soaking pits makes for greater uniformity in heating, lessens the scale loss and guards against washing of the ingots. This was the contention of A.J. Fisher, fuel engineer, Bethlehem Steel Co., Sparrows Point, Md., in discussing the foregoing paper. The lower B.t.u. fuels are best suited to regenerative pits and the higher B.t.u. fuels to recuperative pits. He pointed out two schools of thought in the heating of ingots. One group is of the opinion that ingots should be heated in a reducing atmosphere and the other in an oxidizing atmosphere. In the one case the desire is to scale heavily to eliminate the surface defects. However, when a slabbing mill is available, this is not important; instead we strive toward heat economy, he stated.

In speaking on "Southern Blast Furnace Practice," J. E. Urquhart, general superintendent, Woodward Iron Co., Woodward, Ala., stated that southern pig iron manufacture centers in Birmingham. Ore, coal and limestone are literally side by side, thus differing from northern practice. Close proximity of the ore to the plants make it unnecessary to stock winter supplies. In fact, there are no stocking facilities at any of the plants in the district. Normally, he stated, the ore is delivered from the mines to the stockhouse of the blast furnace. No car dumpers, ore unloaders, transfer cars or ore bridges are required.

Ample Hematite Supply

The brown ores in the district now are limited. The backbone of the supply of ore is hematite and the supply located in the Red Mountain area is said to be ample for the next 100 years. This ore, he pointed out, varies in iron from 32 to 40 per cent, silica from 11 to 22 per cent and lime from 10 to 9 per cent. The lime content of the ore decreases drastically in the deposits located in the west and in the east of the district.

The slag volume at the furnaces varies from 1900 to 2100 pounds per ton of iron and accounts largely for the high coke consumption at district stacks. Until recently, labor has been so cheap and the cost of raw materials so low that there was little incentive to modernize plants but this condition now has changed. The speaker mentioned that southern operators also have been extremely slow in bettering their preparation of ore for charging. Normally it was put through a crusher, crushed to 3 to 4 inches

and then charged. However, in 1929 the Woodward company installed a crusher and later a screening plant including a secondary crusher and resorted to the charging of finer materials.

The Republic Steel Corp. recently installed the first sintering plant in this district, mixing the product from the machines with the ore with satisfactory results. This plant was described in the Feb. 8, 1937, issue of STEEL. As a result of a research program inaugurated at the Woodward plant relative to the crushing of ore, there was effected a decrease in the coke consumption of 450 pounds per ton of iron and an increase of 14 per cent in the tonnage produced.

Mr. Urquhart also stressed the fact that the preparation of coke has been neglected in the Birmingham district. All the coal used for coke requires washing. Only until recent years was the coal pulverized. Present practice involves passing the coke through a crusher to greak down the oversize and then over a screen. However, the first coke screening system at furnace bins now is being installed by a district producer of iron.

All southern furnaces burdened on basic iron require checking the blast. The speaker stressed the necessity of doing this particularly when the furnace is operated on basic or low silicon iron and when the hearth diameter exceeds 14 feet.

High humidity in the summer months and high moisture in the winter months also have their effect on the coke consumption. In view of this fact the speaker is of the opinion that air conditioning of blast furnaces is an immediate requirement. In fact, he announced that the Woodward Iron Co. is about to air condition one of its stacks.

Flue Dust Is High

Flue dust is accumulated in large amounts at various stacks in the district. Some furnaces, in fact, have been giving large amounts away free to the railroads for filling purposes. The amount of wind blown is high considering northern practice, thus making for high flue dust production.

Gas cleaning has not progressed to any great extent. No plant here has clean gas for underfiring coke ovens. Small checkers, therefore are not installed in the stoves. In basic iron smelting the hot blast temperature usually is below 1200 degrees Fahr.

In conclusion, the speaker commented on what the future holds for southern blast furnace practice. The tendency, he contended is toward finer crushed ores and the sintering of fines, the beneficiation of the lean ores, installation of air conditioning systems, crushing a furnace coke and the charging of the small size pieces separately, better ore and coke preparation, finer cleaning of gas and the installation of smaller checkers in the stoves.

In discussing this paper, J. M. Harris, superintendent of blast furnaces, Tennessee Coal, Iron & R. R. Co., stressed the importance of the proper preparation of raw materials. Furnace lines have been modified and obsolete equipment eliminated, he stated, though we have not accomplished what we had hoped. The preparation of raw materials and the proper sizing must be done inasmuch as by crushing the ore to a fine state, a greater area per unit of volume is exposed.

Tuesday members and guests visited all the properties of the Tennessee Coal, Iron & Railroad Co. The trip to and from the plants, covering more than 34 miles, was made by train. Lunch was served in the annealing department of the new continuous mill at Fairfield works.

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Foundry Association Proceedings Issued

■ *Transactions of the Amerian Foundrymen's Association*, 1938, edited by R. E. Kennedy and N. F. Hindle; cloth, 948 pages, 6 x 9 inches; published by the American Foundrymen's association, 222 West Adams street, Chicago, and supplied to members for $3, to nonmembers for $15.

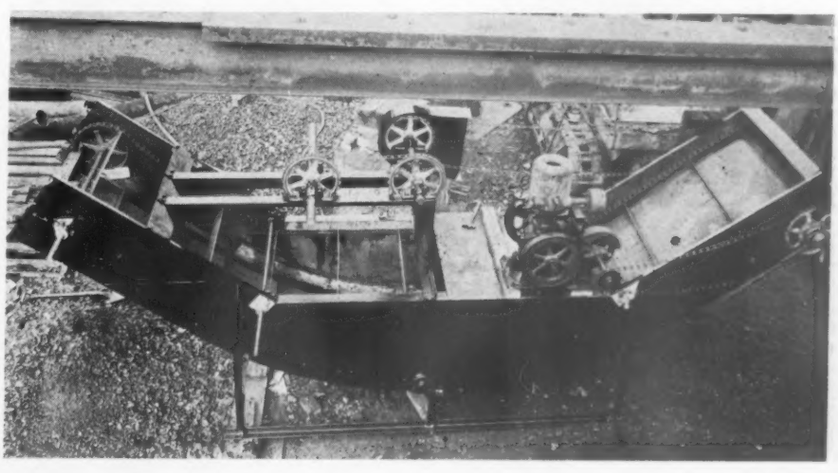
This is the annual bound volume containing papers and reports presented at the 1938 convention of the association. It contains 45 papers and reports and resulting discussions. The papers cover a wide range of subjects pertaining to various branches of the foundry industry, including gray cast iron, malleable cast iron, and steel. In addition the book contains papers on foundry refractories, patternmaking and materials handling. While many of the papers are technical, the practical side of the foundry has not been neglected in other papers in this volume.

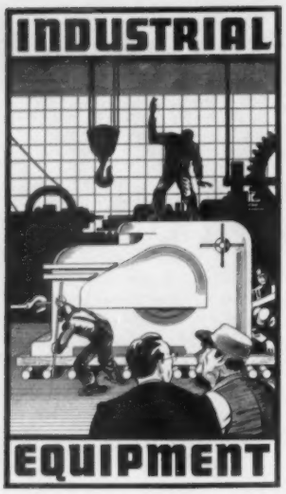
Separates Unburned Fuel From Clinkers in Ashes

■ C. E. Pool and H. E. Davisson, Clarksburg, W. Va., have developed and patented a machine for recovering unburned coke from producer gas plant ash, power plant pan ash, coke breeze dumps and general industrial ash dumps. The principle of fuel recovery employed is based on specific gravity, flotation being the method of separating combustible material from clinkers.

The Pool separator is said to operate with economy and is mobile and self-contained. As shown in the accompanying illustration, it consists principally of a curved-frame tank and a simple conveyor system for carrying good fuel out one end and waste materials out the other. The upward curved floor and straight sides of the tank form conveyor chutes. Machine can be fed with pan ash or similar material by two men with shovels or by a conveyor. Ash is dumped into center of the tank, where it separates immediately into combustibles, specific gravity of which is less than that of water, and clinkers, which are heavier than water. Maximum separation is attained by adding lime, chalk, fireclay, loam, carbide slime or other materials until density of the water has been increased to a hydrometer reading of about 25 Baume A. An endless conveyor, having 24 flights, travels 100 feet per minute to give this machine a theoretical capacity of 71 cubic yards per hour.

Using variation in specific gravity as its principle of operation, this machine separates ashes into unburned combustible materials and clinkers. It has been found that most ash dumps contain over 50 per cent coke



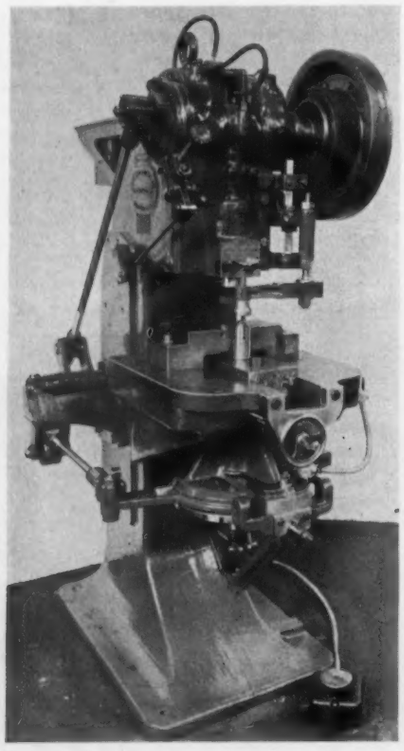


Changes Made in High Speed Notching Presses

■ V & O Press Co., Hudson, N. Y., has announced several changes in its high speed notching presses and fixtures.

One feature is a solenoid used to trip the machine and stop it at end of cycle, working in conjunction with a limit switch. Foot switch makes it possible to operate machines without undue fatigue. Limit switch automatically releases solenoid and stops machine at end of cycle eliminating all throwout mechanism previously used.

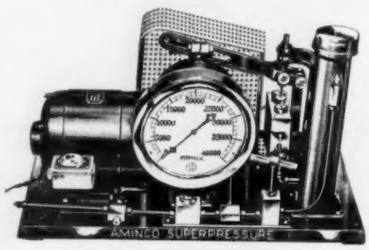
Another feature is an expanding disk holder. This holder makes the notching of laminations possible without a keyway. Holder is made similar to a split collet, being opened by means of a draw-in bolt which is actuated by solenoid. At end of cycle draw bolt is released permitting disk holder to contract and leaving the notched lamination loose on spindle. It is claimed considerable time is saved, as it is not necessary to line up slots in relation to keyway. Easier loading and unloading of laminations also is permitted.



Hydraulic Pump for High Test Pressures

■ American Instrument Co., Silver Spring, Md., has announced a new motor driven, hydraulic pump capable of developing pressures up to 30,000 pounds per square inch.

Pump is used for creating very high test pressures for determining bursting strength of cylinders and spheres; for operating high pressure and hydraulic intensifiers and



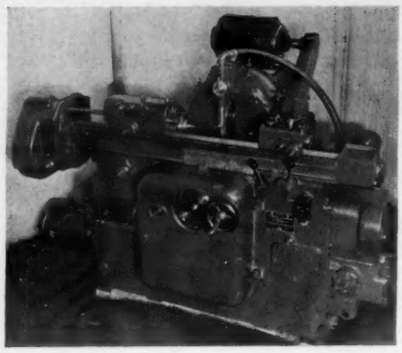
for carrying out experiments to determine effect of extremely high pressures and sudden releases on various materials.

Thread Grinder Feed Compensates for Truing

■ Jones & Lamson Machine Co., Springfield, Vt., has announced a universal thread grinding machine, designed to grind threads of every type up to 5 inches diameter, 12 inches long, anywhere on work 24 inches in length. Machine swings work 7 inches in diameter and accommodates 30 inches between centers.

This unit has been designed around an automatic wheel truing device. Accuracy of thread angle is maintained within plus or minus 5 minutes on the half-angle, lead to plus or minus 0.0002-inch with a cumulative error not exceeding 0.001-inch in 12 inches. On production work machine is said to grind threads automatically to a pitch tolerance of 0.0005-inch.

Grinding wheel spindle and its driving motor are mounted on a cradle to permit tilting wheel to correspond with helix angle of the thread to be ground. Spindle speed changes are made through sliding



gears, with positive forward and reverse speeds provided for two-way grinding of any thread within the machine's capacity. Tailstock is a lever-operated unit, and is adjustable on the work slide. With suitable formers, machine will grind combinations of taper, straight and taper, or double taper threads.

Work drive, with pushbutton control, is powered by a motor geared to furnish power to revolve work and for table travel. Machine is equipped to feed in the grinding wheel automatically until correct size is reached. Wheel is advanced automatically also to compensate for decrease in its size after truing.

Announces Natural Gas Conversion Attachment

■ Caterpillar Tractor Co., Peoria, Ill., has announced a natural gas conversion attachment for its six-cylinder, 125-horsepower diesel engines.

Attachment is characterized by simplicity. To change from diesel to natural gas, pistons do not have to be touched nor do any changes have to be made to interior parts of engine. Diesel cylinder head, injection valves and lines are removed and replaced with a special head, lowering compression and providing spark plugs. Diesel fuel

injection pumps are replaced by a magneto, and a carburetor is added to the intake air line. It is claimed entire process takes about four hours. To change back to diesel is equally simple.

Develops New Polishing And Buffing Machine

■ Hammond Machinery Builders Inc., Kalamazoo, Mich., has added to its line the type "J" Model S automatic polishing and buffing machine. Autodopers, which automatically apply composition to the wheels can be used on this machine.

Machine will carry from 1½ to 7½-horsepower motors. Although primarily designed for rounds up to 6⅝ inches diameter, which are

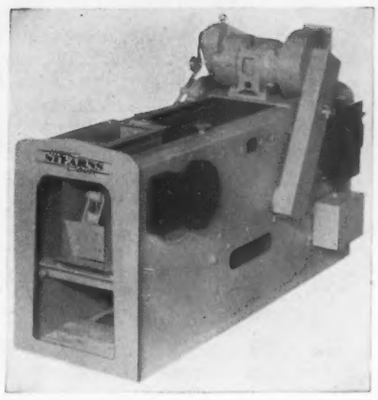
held by mechanical fixtures, and flats up to 3 x 6 inches held by magnetic chucks, some rounds can be handled up to 10⅝ inches diameter and larger and odd shape flats.

Rotated table has 8 revolving spindles connected by chain sprocket drives to ball bearing worm reducing unit. For loading and unloading, however, the three spindles at operator's station cease revolving. Table is driven by ½-horsepower motor with V-belt drive, having variable pitch sheaves for quick and easy change of table indexing speeds.

Machine has a capacity of about 1800 pieces per hour, depending on nature of work.

Improves Efficiency and Appearance of Separator

■ Stearns Magnetic Mfg. Co., Milwaukee, has announced improvement of its Type AM magnetic separator, both in its operating efficiency and in its appearance. This unit is employed largely in the treatment of magnetite ore, roasted hematite, sponge iron, bronze



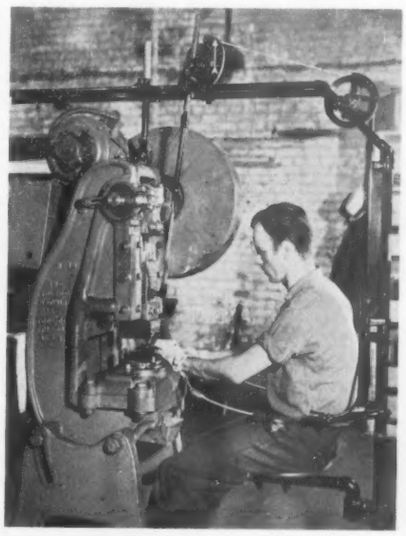
powder, etc., and for the removal or reclamation of fine iron.

Instead of the old style bolted open frame, separator now is enclosed in a streamlined welded steel housing. An added feature is the vibrating feeder device that provides accurate control of the material being treated and affords uniform speed in desired thicknesses for most effective magnetic separation.

Keeps Hands of Press Operators Out of Danger

■ Positive Safety Mfg. Co., 4408 Perkins avenue, Cleveland, has developed a punch press safety device which keeps operator's hands out of the danger zone by means of steel-cored cables which pull his hands away from the die during the stroke of the ram.

There is no interference in the handling of stampings. Operator can feed to the dies as fast as he can operate the press. Pull-back is adjustable in conformity with the dies. Operator, after placing stamping between the dies, naturally takes his hands to a safe position when reaching for material. There is no



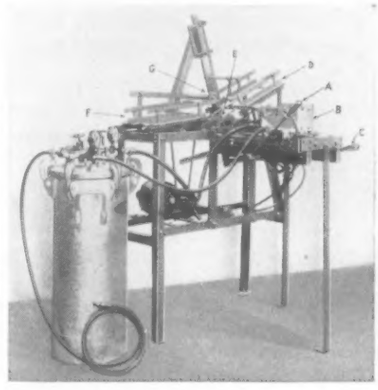
jerk unless he is in actual danger.

In illustration device is shown mounted on the floor. Where floor space is limited, it can be supported from an overhead beam or attached directly to the ceiling. These devices may be applied successfully to punch presses, toggle presses, drop hammers and embossing presses.

Spray Machine Finishes Inside of Cylinders

■ Eclipse Air Brush Co., 390 Park avenue, Newark, N. J., has added to its line a machine for the semi-automatic spray coating of the inside of small cylindrical objects such as paper or metal cans.

Cylinders feed by gravity down an adjustable slide and are released by a manually operated lever onto a



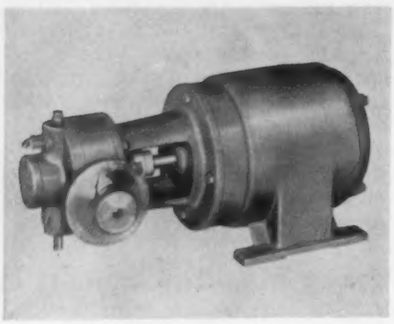
rotating device. A solenoid-operated spray gun fitted with an extension nozzle then is moved forward to coat the inside, while the cylinder is being rotated. Gun is pulled back and the next cylinder comes down, pushing the finished one on its way. A 1/6-horsepower motor operates the automatic part of the equipment.

An average production of 10,000 pieces per 8-hour day is said to be possible with this machine.

Hydraulic Pump Provides Accuracy of Control

■ Denison Engineering Co., Columbus, O., has announced a small variable volume hydraulic pump which provides for accuracy of control to a minimum of 5 cubic inches per minute.

Pump has three-piston cylinder body and rotary valve combined in a single shaft. Shaft and rotary are heat-treated tool steel, supported in one roller bearing and one ball bearing. Valve plate is hydraulic bronze, especially developed for this purpose. Motor drives pump through a standard flexible coupling, spider of



which is easily and economically replaceable.

Pump is claimed to be good for continuous operation at 1000 pounds per square inch and for intermittent operation at 2000 pounds per square inch. It is built in two volume capacities, 100 cubic inches and 175 cubic inches.

Machine Adaptable to Many Bending Operations

■ Cyril Bath & Co., 6982 East Seventieth street, Cleveland, have developed an interesting tool for metal forming, first introduced in connection with the manufacture of refrigerator cabinets. It can be applied also to other forms of bending where it is desired to form curved sections of flanges, or tee or channel shapes members or tubing, with a minimum distortion of shape or wrinkling of the material.

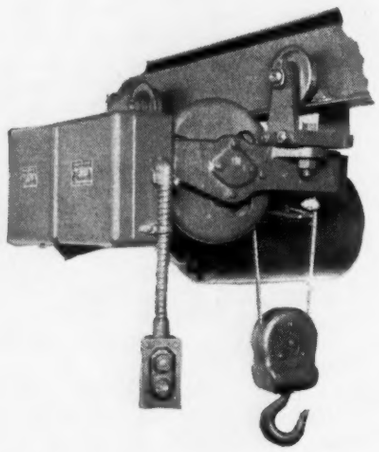
In forming a tangent bent corner of a refrigerator case, 18-gage strip is received with the flanges rolled. It is put into the machine and located by a notch in the rear flange. Blankholder then moves forward and locks sheet in position into a curved die, which forms the top crown of the refrigerator. Guide rollers then are forced around tangent plates, completing crown and sides of the cabinet in one motion. Production rate of about 120 pieces an hour was attained with this bender.

Use of this method is said to simplify assembly and welding problems. Basic principle involved is that of rolling a guided flat shoe around material being formed and encasing material while action is in progress. The new universal machine is adaptable in different sizes to a variety of bending problems.

Two-Speed Hoist Has Low Headroom Design

■ Electro Lift Inc., 30 Church street, New York, has placed on the market a two-speed alternating current hoist, designed to give slow speeds for starting, inching, running and stopping, and fast speeds for rapid and efficient handling.

Hoist has a squirrel-cage motor, and is built in sizes of ¼ to 6-tons. It may be equipped with traveling



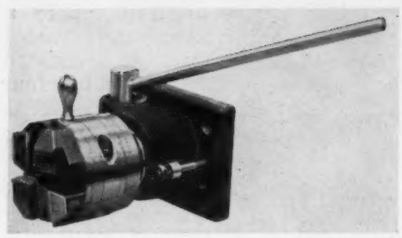
rope guide on drum to eliminate hazard of crossed or piled up cables where loads are pulled at an angle.

It has worm drive with worm and wheel running on tapered roller bearings, fully enclosed within the gear case and running in a bath of oil. This provides simple construction and quiet operation. Motor has ball bearings and is attached directly to hoist frame. Entire load is carried on cast steel frame. Hoist has close headroom, allowing the hook to reach within a minimum distance of overhead track. Control may be either rope or pushbutton type.

Adapter for Die Head Permits Floating Action

■ Landis Machine Co., Waynesboro, Pa., has announced a new type sliding adapter for effecting better application of Landmatic heads to heavy duty turret lathes. Adapter not only permits a floating action for the die head but also provides a gear mechanism for starting the die head onto the work by hand.

With this device the forward or



thread starting movement of the die head is accomplished through an intermediate gear mechanism contained within the adapter. A rack gear is milled axially along the peripheral surface of a bushing to which the die head shank is fitted. A pinion gear, whose teeth engage the rack gear, is fitted with a long handle which is used to actuate movement of the bushing. Die head is opened automatically by a lug which extends through a longitudinal slot in the adapter housing.

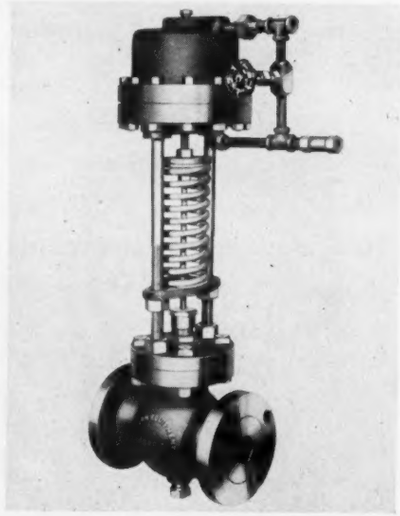
Use of this adapter is said to assure good starting action for the head and to improve lead and quality of the thread.

Governor Designed for Reciprocating Pumps

■ Northern Equipment Co., Erie, Pa., has developed a pump governor, especially designed for service on steam-driven reciprocating pumps or on centrifugal pumps driven by small steam turbines.

Governor is spring-loaded to provide accuracy in pressure control. Balanced bevel-seating valve piston also gives assurance of instant response to pressure variations. Four-ply brass syphon bellows, the actuating element, is protected against water hammer or sudden changes in pressure by a stabilizer.

Furnished in sizes from ¾-inch to 3 inches, in 250 and 300-pound pressure standards only.



Outlook Clouded By Lag In Sales

March Lacks Seasonal Recovery; Output Off Further

MARKET IN TABLOID ★

Demand

Generally steady or lower compared with month ago.

Prices

Steady on steel products; scrap tone easier.

Production

Dropped 1 point to 54½ per cent.

■ ABSENCE of expected improvement in steel demand during March tends to cloud the outlook for the new quarter.

With only a few exceptions, last month's business did no more than hold its own at the February rate, and in some instances a decrease occurred. Small variations in steel buying the past 30 days are reflected in the scant improvement in ingot output during March.

Nevertheless, ingot production the first quarter increased nearly 70 per cent over the corresponding 1938 period, despite a progressively smaller gain compared with a year ago as the quarter advanced. The decrease from the like period of 1937 was more than 35 per cent. Steelmaking last week declined 1 point to 54½ per cent. This compares with 36 per cent a year ago.

Daily average pig iron production in March is estimated at 77,182 tons, compared with 73,578 tons in February and 47,426 tons in March, 1938. The gain over last year was nearly 63 per cent. Total output the first quarter was 6,628,235 tons, an increase of 57 per cent over the 4,221,406 tons produced a year ago.

Disposition of steel users to restrict orders to early needs is seen in the decrease in size of individual purchases the past month. In the East, finished steel sales in March were slightly ahead of February, but some producers did 65 per cent of the month's business in the first half, indicative of the letdown the past two weeks.

Structural Shape Demand Resists Slower Tendency

Structural steel has been more active lately and promises to be a sustaining factor in steel production this spring. Concrete reinforcing bar shipments and prospective business also are maintained at relatively high levels. Tin plate demand, while in some instances falling below earlier expectations, appears assured of further seasonal gains shortly. Production currently is at 60 per cent.

A letdown in sheet and strip buying reflects to a large extent the continuation of slow demand from the automotive industry. Motorcar assemblies last week declined about 3400 units to 85,980, following four consecutive weekly increases. Output a year ago was 57,500 units. March production was more than 60 per cent ahead of the 1938 month. With the exception of last year assemblies were the smallest for March since 1934 and almost 5 per cent below the March average for the past five years.

All leading makers shared in last week's decline in automotive operations. General Motors cut from 35,230 units to 33,260; Chrysler from 20,825 to 20,375; Ford from 22,350 to 22,230; and all others from 10,995 to 10,115.

Railroad Equipment Buying Slow; More Rails Ordered

Markets for railroad materials continue quiet. Closing on contemplated freight car orders by various roads still is awaited, and in the meantime only moderate steel tonnages are being taken for repair purposes. Union Pacific is going ahead with plans to build 300 flat cars in its own shops, and the Southern Pacific has placed two streamlined passenger trains.

Rail production is sustained, and the decline in backlogs has been arrested partially by orders from two roads. These are 9000 tons for the Chicago & North Western and 4000 tons for the Virginian.

Last week's decrease in ingot production occurred in the face of heavier operations at some centers. Pittsburgh increased 1 point to 49 per cent; Wheeling was up 3 to 66 per cent; Buffalo rose 4½ points to 42; and Detroit advanced 2 to 74. Eastern Pennsylvania was unchanged at 40 per cent and Cleveland held at 52½.

On the other hand, Chicago was down 3 points to 53½ and Youngstown dropped 4 points to 50. Reductions in other districts included 16 points to 62 at Birmingham, 15 points to 50 in New England, 4 points at Cincinnati to 51 and 14½ points at St. Louis to 43.

Scrap prices are fairly steady, despite an easier tone than prevailed a few weeks ago. The scrap composite is unchanged at $15.04. Finished steel prices are holding, the composite standing at $56.50.

COMPOSITE MARKET AVERAGES

	Apr. 1	Mar. 25	Mar. 18	One Month Ago Mar., 1939	Three Months Ago Jan., 1939	One Year Ago Apr., 1938	Five Years Ago Apr., 1934
Iron and Steel	$36.42	$36.42	$36.39	$36.40	$36.36	$38.61	$32.67
Finished Steel	56.50	56.50	56.50	56.50	56.50	61.70	53.90
Steelworks Scrap..	15.04	15.04	14.96	14.98	14.77	12.30	12.15

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	April 1, 1939	March 1939	Jan. 1939	April 1938
Steel bars, Pittsburgh	2.25c	2.25c	2.25c	2.45c
Steel bars, Chicago	2.25	2.25	2.25	2.50
Steel bars, Philadelphia	2.57	2.57	2.57	2.765
Iron bars, Terre Haute, Ind.	2.15	2.15	2.15	2.35
Shapes, Pittsburgh	2.10	2.10	2.10	2.25
Shapes, Philadelphia	2.215	2.215	2.215	2.465
Shapes, Chicago	2.10	2.10	2.10	2.30
Plates, Pittsburgh	2.10	2.10	2.10	2.25
Plates, Philadelphia	2.15	2.15	2.15	2.445
Plates, Chicago	2.10	2.10	2.10	2.30
Sheets, hot-rolled, Pittsburgh	2.15	2.15	2.15	2.40
Sheets, cold-rolled, Pittsburgh	3.20	3.20	3.20	3.45
Sheets, No. 24, galv., Pittsburgh	3.50	3.50	3.50	3.80
Sheets, hot-rolled, Gary	2.15	2.15	2.15	2.50
Sheets, cold-rolled, Gary	3.20	3.20	3.20	3.25
Sheets, No. 24, galv., Gary	3.50	3.50	3.50	3.90
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.90
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.35
Wire nails, Pittsburgh	2.45	2.45	2.45	2.75

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$37.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	37.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	37.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	43.00	43.00	43.00	47.00

Pig Iron

	April 1, 1939	March 1939	Jan. 1939	April 1938
Bessemer, del. Pittsburgh	$22.34	$22.34	$22.34	$25.30
Basic, Valley	20.50	20.50	20.50	23.50
Basic, eastern, del. Philadelphia	22.34	22.34	22.34	25.34
No. 2 foundry, Pittsburgh	22.21	22.21	22.21	25.21
No. 2 foundry, Chicago	21.00	21.00	21.00	24.00
Southern No. 2, Birmingham	17.38	17.38	17.38	20.38
Southern No. 2, del. Cincinnati	20.89	20.89	20.89	23.89
No. 2X, del. Phila. (differ. av.)	23.215	23.215	23.215	26.215
Malleable, Valley	21.00	21.00	21.00	24.00
Malleable, Chicago	21.00	21.00	21.00	24.00
Lake Sup., charcoal, del. Chicago	28.34	28.34	28.34	30.34
Gray forge, del. Pittsburgh	21.17	21.17	21.17	24.17
Ferromanganese, del. Pittsburgh	85.33	85.27	90.25	107.77

Scrap

Heavy melting steel, Pittsburgh	$15.75	$15.75	$15.60	$12.70
Heavy melt. steel, No. 2, E. Pa.	13.75	13.375	13.25	11.55
Heavy melting steel, Chicago	14.25	14.25	13.75	11.45
Rails for rolling, Chicago	17.25	17.25	17.75	15.25
Railroad steel specialties, Chicago	16.25	16.25	16.00	13.75

Coke

Connellsville, furnace, ovens	$ 3.75	$3.75	$3.75	$4.25
Connellsville, foundry, ovens	5.00	5.00	5.00	5.25
Chicago, by-product fdry., del.	10.50	10.50	10.50	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.15c
Chicago, Gary	2.15c
Cleveland	2.15c
Detroit, del.	2.25c
Buffalo	2.15c
Sparrows Point, Md.	2.15c
New York, del.	2.39c
Philadelphia, del.	2.32c
Granite City, Ill.	2.25c
Middletown, O.	2.15c
Youngstown, O.	2.15c
Birmingham	2.15c
Pacific Coast points	2.65c

Cold Rolled

Pittsburgh	3.20c
Chicago, Gary	3.20c
Buffalo	3.20c
Cleveland	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.52c
New York, del.	3.54c
Granite City, Ill.	3.30c
Middletown, O.	3.20c
Youngstown, O.	3.20c
Pacific Coast points	3.80c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.95c
Pacific Coast	4.65c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, base	2.10c
Sparrows Point, base	2.10c
Claymont, del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c
Pittsburgh	3.35c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.25c
Chicago or Gary	2.25c
Duluth	2.35c
Birmingham	2.25c
Cleveland	2.25c
Buffalo	2.25c
Detroit, delivered	2.35c
Philadelphia, del.	2.57c
Boston, delivered	2.62c
New York, del.	2.59c
Gulf ports	2.60c
Pacific Coast points	2.85c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.10c
Chicago or Gary	2.10c
Detroit, delivered	2.20c
Cleveland	2.10c

Buffalo	2.10c
Birmingham	2.10c
Gulf ports	2.45c
Pacific coast points	2.70c

Iron

Chicago, Terre Haute	2.15c
Philadelphia	2.47c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Chicago, Gary, Buffalo Cleve., Birm., Young., Sparrows Pt., Pitts.	2.05c
Detroit, delivered	2.15c
Gulf ports	2.40c
Pacific coast ports	2.50c
Philadelphia, del.	2.22c

Rail steel, straight lengths, quoted by distributors

Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birmingham	1.90c
Detroit, delivered	2.00c
Gulf ports	2.25c
Pacific Coast	2.35c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard wire nails	$2.45
Cement coated nails	$2.45

(Per pound)

Polished staples	3.15c
Galv. fence staples	3.40c
Galv. barbed wire, standard 12½ gage two-point hog, 80-rod spool $2.80; two-point cattle, 80-rod spool	$2.62
Annealed fence wire	2.95c
Galv. fence wire	3.35c
Woven wire fencing (base C. L. column)	67.00
Single loop bale ties, (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)

Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.70c	3.40c
Chicago	2.70c	3.40c
Gary, Ind.	2.70c	3.40c
Detroit	2.75c	*3.50c
Cleveland	2.70c	3.40c
Buffalo	2.70c	3.40c

*Delivered.

Alloy Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.80c
Detroit, delivered	2.90c

Alloy	Diff.	Alloy	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 1.50-4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring flats	0.15
6100 bars	1.20
6100 spring flats	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Electric furnace up 50 cents.

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.75c

Strip and Hoops

(*Base, hot-rolled, 1 to 25 tons; cold-rolled, 3 to 25 tons*)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.15c
Detroit, del.	2.25c
Philadelphia, del.	2.47c
New York, del.	2.51c
Cooperage hoop, Youngs., Pitts., Chicago, Birm.	2.25c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.15c

Carbon	Cleve. Pitts.
0.26—0.50	2.95c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	3.10c
Detroit, del.	3.20c
Worcester, Mass.	3.50c

Lamp stock up 10 cents.

Rails, Fastenings

(*Gross Tons*)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00

Cents per pound

Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1⅛ and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts attached 72.5 off; in packages with nuts separate 72.5-12½ off; bulk 84 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	60 off
Elevator bolts	60 off
Plow bolts	68.5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less	67	70
⅞—1-inch	64	65
1⅛ and larger	62	62

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	65-10 off

Square Head Set Screws

Upset, 1-in., smaller	73-10 off
Headless set screws	62-10 off

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila., to jobbers	60 off
and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
⅛	63½	54
¼	66½	58
1—3	68½	60½

Iron

⅜	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55
11 and 12	63½	54

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O. D.	13	$ 9.72	$23.71
1¾" O. D.	13	11.06	22.93
2" O. D.	13	12.38	19.35
2¼" O. D.	13	13.79	21.68
2¼" O. D.	12	15.16	....
2½" O. D.	12	16.58	26.57
2¾" O. D.	12	17.54	29.00
3" O. D.	12	18.35	31.36
3½" O. D.	11	23.15	39.81
4" O. D.	10	28.66	49.90
5" O. D.	9	44.25	73.93
6" O. D.	7	68.14	....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O. D.	13	$ 7.82	$ 9.01
1¼" O. D.	13	9.26	10.67
1½" O. D.	13	10.23	11.79
1¾" O. D.	13	11.64	13.42
2" O. D.	13	13.04	15.03
2¼" O. D.	13	14.54	16.76
2½" O. D.	12	16.01	18.45
2½" O. D.	12	17.54	20.21
2¾" O. D.	12	18.59	21.42
3" O. D.	12	19.50	22.48
3½" O. D.	11	24.62	28.37
4" O. D.	10	30.54	35.20
4½" O. D.	10	37.35	43.04
5" O. D.	9	46.87	54.01
6" O. D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$42.00-43.00
4-in., Birmingham	45.00-46.00
4-in., Chicago	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(*Gross Tons*)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅝-inch incl.	43.00
Do., over ⅝ to 41/64-in. incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Milwaukee, ovens	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	5.75c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$28.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$22.00	$22.50	$21.50	$23.00
Birdsboro, Pa.	22.00	22.50	21.50	23.00
Birmingham, Ala.‡	17.38	.....	16.38	22.00
Buffalo	21.00	21.50	20.00	22.00
Chicago	21.00	21.00	20.50	21.50
Cleveland	21.00	21.00	20.50	21.50
Detroit	21.00	21.00	20.50	21.50
Duluth	21.50	21.50	.....	22.00
Erie, Pa.	21.00	21.50	20.50	22.00
Everett, Mass.	22.00	22.50	21.50	23.00
Granite City, Ill.	21.00	21.00	20.50	21.50
Hamilton, O.	21.00	21.00	20.50	.....
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	19.00	.....	.....	.....
Sharpsville, Pa.	21.00	21.00	20.50	21.50
Sparrow's Point, Md.	22.00	.....	21.50	.....
Swedeland, Pa.	22.00	22.50	21.50	23.00
Toledo, O.	21.00	21.00	20.50	21.50
Youngstown, O.	21.00	21.00	20.50	21.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	22.39	22.39	21.89	22.89
Baltimore from Birmingham	22.78	.....	21.66	.....
Boston from Birmingham	22.12	.....	.....	.....
Boston from Everett, Mass.	22.50	23.00	22.00	23.50
Boston from Buffalo	22.50	23.00	22.00	23.50
Brooklyn, N. Y., from Bethlehem	24.50	25.00	.....	.....
Canton, O., from Cleveland	22.39	22.39	21.89	22.89
Chicago from Birminghom	†21.22	.....	.....	.....
Cincinnati from Hamilton, O.	21.24	22.11	21.61	.....
Cincinnati from Birmingham	21.06	.....	20.06	.....
Cleveland from Birmingham	21.32	.....	20.82	.....
Mansfield, O., from Toledo, O.	22.94	22.94	22.44	22.44
Milwaukee from Chicago	22.10	22.10	21.60	22.60
Muskegon, Mich., from Chicago, Toledo or Detroit	24.19	24.19	23.69	24.69
Newark, N. J., from Birmingham	23.15	.....	.....	.....
Newark, N. J., from Bethlehem	23.53	24.03	.....	.....
Philadelphia from Birmingham	22.46	.....	21.96	.....
Philadelphia from Swedeland, Pa.	22.84	23.34	22.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	23.45	23.45	22.95	22.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	21.50	21.50	21.00	.....
St. Louis from Birmingham	†21.12	.....	20.62	.....
St. Paul from Duluth	23.63	23.63	.....	24.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $26.50, base; $27.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$20.50	Lake Superior fur.	$25.00
Pitts. dist. fur.	20.50	do., del Chicago	28.34
		Lyles, Tenn.	23.50

†Silvery

Jackson county, O., base: 6-6.50 per cent $25.50; 6.51-7—$26.00; 7-7.50—$26.50; 7.51-8—$27.00; 8-8.50—$27.50; 8.51-9—$28.00; 9-9.50—$28.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$40.00
Joliet, E. Chicago	49.00
Birmingham, Ala.	40.00

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net ton, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$22.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $17, barge	$18.00
No. 2 lump	18.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $80.00
Do., del. Pittsburgh 85.33

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 28.00
Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman, 2½ carbon 88.00
2% carbon, 93.00; 1%, 103.00
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.65-1.70

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained
chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.75c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do, less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do., less-ton lots 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.05
Do, smaller lots 2.15

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c
Do, 2% 12.50c
Spot ¼c higher

Silicon Briquets, contract carloads freight allowed, ton $69.50
Carload, spot 74.50
Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, bulk freight allowed, lb. 4.50c
Ton lots 5.00c
Less-ton lots 5.25c
Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, gross ton $97.50
Do, spot 102.50
34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do. under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24
Boston	3.98	4.21	5.21	3.85	3.85	5.66	3.86	4.93	4.61
New York (Metropolitan)	3.94	4.11	4.11	3.76	3.75	5.56	3.40	4.60	4.50
Philadelphia	3.60	3.60	4.10	3.40	3.40	5.00	3.40	....	4.33
Baltimore	3.80	3.95	4.35	3.65	3.65	5.00	3.70	5.05	4.30
Norfolk, Va.	4.00	4.15	4.55	3.85	3.85	5.20	3.90	4.80	5.40
Buffalo	3.60	3.97	3.97	3.77	3.55	5.40	3.50	4.55	4.40
Pittsburgh	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.60	4.50
Cleveland	3.50	3.65	3.65	3.55	3.73	5.33	3.50	4.70	4.62
Detroit	3.43	3.58	3.83	3.75	3.80	5.42	3.58	4.65	4.74
Cincinnati	3.85	3.82	3.82	3.80	3.83	5.43	3.57	....	4.57
Chicago	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.45	4.50
Minneapolis	3.85	4.00	4.00	3.80	3.80	5.40	3.75	5.10	4.75
Milwaukee	3.73	3.88	3.88	3.68	3.68	5.28	3.63	4.58	4.63
St. Louis	3.87	4.02	4.02	3.82	3.82	5.42	3.77	4.72	4.77
Kansas City	4.15	4.30	4.30	4.10	4.10	5.70	4.10	....	4.75
Memphis	4.00	4.15	4.15	3.95	3.95	5.71	3.90	....	5.25
Chattanooga	3.90	4.05	4.05	3.85	3.85	5.80	3.80	....	4.40
Tulsa, Okla.	4.64	4.79	4.79	4.59	4.59	6.19	4.54	....	5.54
Birmingham, Ala.	3.50	3.65	3.65	3.45	3.45	5.83	3.40	....	4.75
New Orleans	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60
Houston, Tex.	3.50	5.85	6.25	4.05	4.05	5.65	3.95	....	5.25
Seattle	4.30	4.50	5.85	4.05	4.15	5.90	3.95	....	5.25
Portland, Oreg.	4.00	4.40	6.10	4.00	4.00	5.50	3.95	6.50	4.75
Los Angeles	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	4.75
San Francisco	3.65	4.05	6.00	3.60	3.60	5.20	3.60	6.40	5.15

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars: 2300	3100
Boston	3.61	4.18	4.28	7.65	6.25	6.00	8.05	8.73	7.33
New York	3.66	4.14	4.14	7.50	6.10	5.85	....	8.69	7.29
Philadelphia	3.66	4.11	3.85	7.46	6.06	5.81	8.71	....	....
Baltimore	....	4.10	3.95	....	....	....	....	....	....
Norfolk, Va.	....	4.20	....	....	....	....	....	....	....
Buffalo	3.57	3.80	3.80	7.25	5.85	5.60	7.65	8.25	6.85
Pittsburgh	3.35	3.70	3.80	7.35	5.95	5.70	7.75	8.35	6.95
Cleveland	3.35	3.80	3.70	7.45	6.05	6.05	7.85	8.25	6.85
Detroit	3.55	3.85	3.58	7.57	6.17	5.92	7.39	8.55	7.15
Cincinnati	3.60	4.05	3.90	7.59	6.19	5.94	8.99	8.60	7.20
Chicago	3.65	3.80	3.80	7.25	5.85	5.60	7.65	8.25	6.85
Minneapolis	....	4.39	4.00	7.60	6.20	8.79	9.34	8.94	7.54
Milwaukee	....	3.93	3.93	7.48	6.08	5.83	7.88	8.48	7.08
St. Louis	3.76	4.32	4.07	7.62	6.22	5.97	8.02	8.62	7.22
Kansas City	4.46	4.60	....	....	....	....	....	....	....
Memphis	....	4.61	....	....	....	....	....	....	....
Chattanooga	....	4.44	....	....	....	....	....	....	....
Tulsa, Okla	....	4.84	....	....	....	....	....	....	....
Birmingham, Ala.	....	4.73	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.60	5.65	....	7.80	7.65	8.45	....	....
Portland, Oreg.	....	5.60	6.10	9.00	8.00	7.85	8.70	....	....
Los Angeles	4.45	6.50	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	*9.30	6.55	5.20	9.65	8.80	8.65	9.30	10.65	9.80

* Based on minimum quantity.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, March 30

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Quoted in dollars at current value	Continental Channel or North Sea ports, gross tons **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$23.45 5 0 0	$17.25	2 0 6
Basic bessemer	....	15.98	1 17 6
Hematite, Phos. .03-.05	26.97 5 15 0*	.....	.....
Billets	$34.59 7 7 6	$38.34	4 10 0
Wire rods, No. 5 gage	53.35 11 7 6	42.60	5 0 0
Standard rails	$44.56 9 10 0	$48.99	5 15 0
Merchant bars	2.30c 11 0 0	1.85c to 1.95c	4 15 0 to 5 0 0
Structural shapes	2.09c 10 0 0	1.85c to 1.90c	4 15 0 to 4 17 6
Plates, †¼ in. or 5 mm.	2.29c 10 18 9	2.10c to 2.34c	5 7 6 to 6 0 0
Sheets, black, 24 gage or 0.5 mm.	2.72c 13 0 0	2.93c	7 10 0*
Sheets, gal., 24 ga., corr.	3.29c 15 15 0	3.61c	9 5 0
Bands and strips	2.77c 13 5 0	1.95c	5 0 0
Plain wire, base	4.08c 19 10 0	2.39c to 2.83c	6 2 6 to 7 5 0
Galvanized wire, base	4.86c 23 5 0	3.07c to 3.17c	7 17 6 to 8 2 6
Wire nails, base	.....	2.73c to 2.93c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 4.73 1 0 3	.....	.....

British ferromanganese $80.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5	$23.22	4 19 0(a)	$17.44	620.50	$15.17	450	$25.28 63
Basic bess. pig iron	21.69	4 12 6(a)	.....	...	.....	...	27.88(b) 69.50
Furnace coke	5.39	1 4 2	5.96	225	7.25	215	7.62 19
Billets	34.59	7 7 6	25.04	945	28.98	860	38.72 96.50
Standard rails	1.99c	9 10 0	1.56c	1,300	2.06c	1,375	2.38c 132
Merchant bars	2.42c	11 12 0††	1.44c	1,202	1.65c	1,100	1.98c 110
Structural shapes	2.17c	10 8 0††	1.41c	1,173	1.65c	1,100	1.93c 107
Plates, †¼-in. or 5 mm.	2.29c	10 19 3††	1.82c	1,515	2.06c	1,375	2.29c 127
Sheets, black	3.08c	14 15 0§	2.17c	1,805‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.61c	17 5 0	3.12c	2,600	4.13c	2,750	6.66c 370
Plain wire	4.08c	19 10 0	1.92c	1,600	2.48c	1,650	3.11c 173
Bands and strips	2.58c	12 7 0††	1.71c	1,340	1.95c	1,300	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 75 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	†12.00
Bos. dock No. 1 exp.	13.75-14.00
New Eng. del. No. 1	14.00
Buffalo, No. 1	13.75-14.25
Buffalo, No. 2	12.00-12.50
Chicago, No. 1	14.00-14.50
Chicago, auto, no alloy	12.50-13.00
Chicago, No. 2 auto	11.50-12.00
Cincinnati, dealers	12.00-12.50
Cleveland, No. 1	14.50-15.00
Cleveland, No. 2	13.50-14.00
Detroit, No. 1	10.50-11.00
Detroit, No. 2	9.50-10.00
Detroit (industrial)	11.00-11.50
Eastern Pa., No. 1	15.50-16.00
Eastern Pa., No. 2	13.50-14.00
Federal, Ill.	11.75-12.25
Granite City, R. R.	12.00-12.50
Granite City, No. 2	11.00-11.50
Los Angeles, No. 1	12.50-13.50
Los Angeles, No. 2	11.00-11.50
N. Y. dock No. 1 exp.	12.00-12.50
Pitts., No. 1 (R. R.)	16.50-17.00
Pittsburgh, No. 1	15.50-16.00
Pittsburgh, No. 2	14.50-15.00
St. Louis, R. R.	12.25-12.75
St. Louis, No. 2	11.00-11.50
San Francisco, No. 1	12.00
Seattle, No. 1	12.00
Toronto, dirs. No. 1	9.50- 9.75
Valleys, No. 1	15.00-15.50

COMPRESSED SHEETS

Buffalo	12.00-12.50
Chicago, factory	13.00-13.50
Chicago, dealer	12.00-12.50
Cincinnati, del.	11.25-11.75
Cleveland	14.50-15.00
Detroit	12.00-12.50
E. Pa., new mat.	15.50
E. Pa., old mat.	11.00-11.50
Los Angeles	12.50-13.00
Pittsburgh	15.50-16.00
St. Louis	10.00-10.50
Valleys	14.50-15.00

BUNDLED SHEETS

Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	11.00-11.50
Cleveland	11.00-11.50
Los Angeles	14.00
Pittsburgh	14.75-15.25
St. Louis	7.50- 8.00
Toronto, dealers	3.50

SHEET CLIPPINGS, LOOSE

Chicago	10.50-11.00
Cincinnati, dealers	7.25- 7.75
Detroit	8.75- 9.25
†Los Angeles	3.75- 4.00
St. Louis	7.00- 7.50

BUSHELING

Buffalo, No. 1	12.00-12.50
Chicago, No. 1	12.50-13.00
Cincin., No. 1, deal.	8.25- 8.75
Cincinnati, No. 2	3.75- 4.25
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1, new	10.50-11.00
Valleys, new, No. 1	14.25-14.75
Toronto, dealers	4.00- 4.25

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	7.00- 7.50
Chicago	6.75- 7.25
Cincinnati, dealers	5.00- 5.50
Cleveland	7.50- 8.00
Detroit	6.00- 6.50
Eastern Pa.	9.50-10.00
Los Angeles	4.50- 5.00
New York	†3.50- 4.00
Pittsburgh	9.75-10.25
St. Louis	3.00- 4.00
Toronto, dealers	4.00- 4.50
Valleys	9.50-10.00

SHOVELING TURNINGS

Buffalo	7.25- 8.00
Cleveland	8.00- 8.50
Chicago	8.50- 9.00
Detroit	6.75- 7.25
Pitts., alloy-free	11.25-11.75

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	2.00
Buffalo	7.00- 7.25
Cincinnati, dealers	3.50- 4.00
Cleveland	8.50- 9.00
Eastern Pa.	6.50- 7.00
Detroit	6.25- 6.75
New York	†2.50- 3.00
Pittsburgh	8.75- 9.00
Toronto, dealers	5.00- 5.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	14.00-14.50
East. Pa., elec. fur.	13.50
St. Louis	9.50-10.00
Toronto	4.25- 4.50

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†6.00- 6.25
Buffalo	7.50- 8.00
Chicago	6.00- 6.50
Cincinnati, dealers	3.50- 4.00
Cleveland	8.50- 9.00
Detroit	6.25- 6.75
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	2.50- 3.00
Toronto, dealers	4.00- 4.25

RAILROAD SPECIALTIES

Chicago	16.00-16.50

ANGLE BARS—STEEL

Chicago	16.00-16.50
St. Louis	13.75-14.25

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	17.00-17.50
Chicago, leaf	15.75-16.25
Eastern Pa.	17.50-18.00
Pittsburgh	18.00-18.50
St. Louis	15.00-15.50

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	17.00-17.50
Chicago (3 ft.)	16.50-17.00
Chicago (2 ft.)	17.00-17.50
Cincinnati, dealers	17.00-17.50
Detroit	17.00-17.50
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	18.25-18.75
St. Louis, 2 ft. & less	16.25-16.75

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	16.00-16.50
Chicago	14.00-14.50
Cleveland	17.00-17.50
Pittsburgh	17.00-17.50
St. Louis	13.75-14.25
Seattle	16.00

FROGS, SWITCHES

Chicago	14.00-14.50
St. Louis, cut	13.75-14.00

ARCH BARS, TRANSOMS

St. Louis	14.00-14.50

PIPE AND FLUES

Chicago, net	9.00- 9.50
Cincinnati, dealers	7.25-7.75

RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	8.50- 9.00
Cincinnati, dealers	7.25- 7.75
Eastern Pa.	13.50
New York	†8.50- 9.00
St. Louis	9.00- 9.50

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	16.00-16.50
St. Louis, No. 1	10.75-11.25
St. Louis, No. 2	10.00-10.25

FORGE FLASHINGS

Boston district	†8.50
Buffalo	12.00-12.50
Cleveland	12.00-12.50
Detroit	10.50-11.00
Los Angeles	9.00
Pittsburgh	14.50-15.00

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	16.50-17.00

LOW PHOSPHORUS

Buffalo, crops	16.50-17.00
Cleveland, crops	18.00-18.50
Eastern Pa., crops	17.00-17.50
Pitts., billet, bloom, slab crops	19.00-19.50

LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	16.50-17.00
Eastern Pa., crops	17.50-18.00
Pittsburgh	18.00-18.50
Seattle	15.00

RAILS FOR ROLLING

5 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	17.00-17.50
New York	†14.50-15.00
Eastern Pa.	17.00-17.50
St. Louis	16.50-17.00

STEEL CAR AXLES

Birmingham	†15.00-16.00
Buffalo	16.50-17.00
Boston district	†16.00-16.50
Chicago, net	18.00-18.50
Eastern Pa.	21.00-21.50
St. Louis	18.00-18.50

LOCOMOTIVE TIRES

Chicago (cut)	16.00-16.50
St. Louis, No. 1	13.50-14.00

SHAFTING

Boston district	†15.25-15.75
New York	†15.50-16.00
Eastern Pa.	20.50-21.00
St. Louis, 1¼-3¾"	17.50-18.00

CAR WHEELS

Birmingham	†13.50-14.00
Boston dist., iron	†11.00
Buffalo, steel	16.50-17.00
Chicago, iron	13.50-14.00
Chicago, rolled steel	15.50-16.00
Cincin., iron, deal.	13.50-14.00
Eastern Pa., iron	16.50-17.00
Eastern Pa., steel	17.50-18.00
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel	18.00-18.50
St. Louis, iron	14.50-15.00
St. Louis, steel	14.50-15.00

NO. 1 CAST SCRAP

Birmingham	†13.00-13.50
Boston, No. 1 mach.	†10.50-10.75
N. Eng. del. No. 2	12.00-12.50
N. Eng. del. textile	12.50-13.00
Buffalo, cupola	14.50-15.00
Buffalo, mach.	15.50-16.00
Chicago, agri. net	10.50-11.00
Chicago, auto net	13.00-13.50
Chicago, rail'd net	11.50-12.00
Chicago, mach. net	12.00-12.50
Cincin., mach. deal.	14.00-14.50
Cleveland, mach.	17.00-17.50
Eastern Pa., cupola	16.50-17.00
E. Pa., mixed yard	14.50
Los Angeles, net	13.50-14.00
Pittsburgh, cupola	15.25-15.75
San Francisco, del.	13.50-14.00
Seattle	12.00-14.50
St. Louis, cupola	12.00-12.50
St. Louis, agri. mach.	14.00-14.50
St. L., No. 1 mach.	14.50-15.00
Toronto, No. 1, mach., net	12.00-13.00

HEAVY CAST

Boston dist. break.	†9.75
New England, del.	12.50-13.00
Buffalo, break.	11.00-11.50
Cleveland, break, net	13.00-13.50
Detroit, auto net	13.00-13.50
Detroit, break.	10.50-11.00
Eastern Pa.	15.00-15.50
Los Ang., auto, net	13.00-13.50
New York, break.	†10.50-11.00
Pittsburgh, break	13.25-13.75

STOVE PLATE

Birmingham	†7.50- 8.00
Boston district	†8.00- 8.25
Buffalo	13.00-13.50
Chicago, net	8.00- 8.50
Cincinnati, dealers	7.25- 7.75
Detroit, net	8.00- 8.50
Eastern Pa.	13.50
New York, fdy.	†10.00-10.50
St. Louis	7.50- 8.00
Toronto dealers, net	7.50- 8.00

MALLEABLE

Birmingham, R. R.	†10.50-11.00
New England, del.	14.50-15.00
Buffalo	13.50-14.00
Chicago, R. R.	15.50-16.00
Cincin., agri. deal.	12.50-13.00
Cleveland, rail	15.50-16.00
Eastern Pa., R. R.	15.00-16.50
Los Angeles	17.50-18.00
Pittsburgh, rail	15.00-15.50
St. Louis, R. R.	12.25-12.75

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbes.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbes.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-9.25
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	12.00
Swedish low phos.	12.00
Spanish No. Africa basic, 50 to 60% nom.	9.00- 9.50
Tungsten. sh. ton. unit, duty pd. nom.	20.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$23.00-24.00
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% nom.	29.00
So. African, 50-52% nom.	29.00
Indian, 49-50%	27.00-28.00

—The Market Week—

Sheets, Strip

Sheet and Strip Prices, Pages 70 and 71

Pittsburgh—Sheets and strip are quiet, with production off slightly. Buying mostly is for fill-in lots for larger users, although miscellaneous demand is a little more active. Automotive orders are light, with large inquiries also absent. March orders generally were more numerous but smaller individually, leaving the month's tonnage no higher than in February. Sheet production is around 55 per cent, with galvanized output moderately above 60. Hot strip output is near 35 per cent and cold strip about 40.

Cleveland—Sheet demand is fairly steady, but March business was below expectations, recording little change from February. Needs of miscellaneous users are fairly steady and in some cases have increased slightly, but automotive buying still lags. Manufacture of household equipment continues active at a number of plants, although leveling off in operations of some interests is noted.

Chicago—A slight decline is noted in bookings of sheets and strip. General miscellaneous ordering has quieted somewhat, while some mills find a tapering of automotive demand. Agricultural equipment requirements remain consistent.

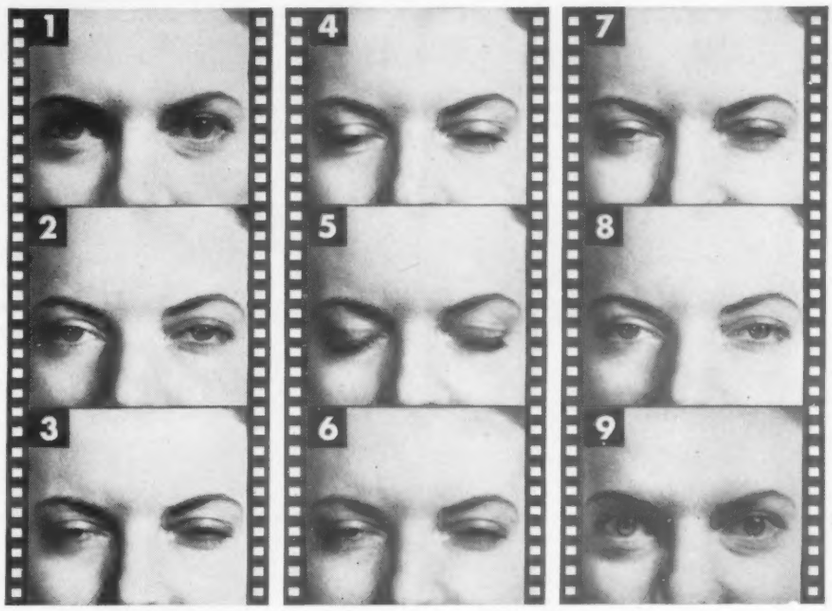
Boston—Merrill & Usher, Worcester, Mass., jobbers, are low on 750 tons of hot-rolled pickled and annealed license tag stock for Massachusetts at 3.709c, delivered, shipments to start July 1. Second low tender was by Carnegie-Illinois Steel Corp., 3.71c, New Hampshire opens this week on close to 100 tons of the same material. Sheet buying is unchanged and slow. There is no sustained improvement in cold strip volume, although demand is well diversified as to specifications. Practically all orders are for prompt delivery. Rerollers as a rule are not operating better than 50 to 60 per cent.

New York—March business was below expectations, barely equalling that of February. Some sellers report decreases of as much as 20 per cent. This showing is attributed in part to slack demand from jobbers and to lighter orders from stove and refrigerator manufacturers. The latter are working against tonnages bought several weeks ago, but some fill-in buying is expected later. Little anticipatory business has appeared from consumers who will be at a disadvantage under new quantity differentials, now effective.

Narrow cold strip buying is spotty, in small lots for immediate

THEY STARED AT A BLINKING GIRL

and found a new key to human comfort



These nine photos, taken with a super-speed camera, show progressive stages in the course of one blink.

OF all the strange tests and experiments carried on at the General Electric Lighting Research Laboratory at Nela Park, Cleveland, few have turned out to be of greater importance to industrial plants than the "Blink Test."

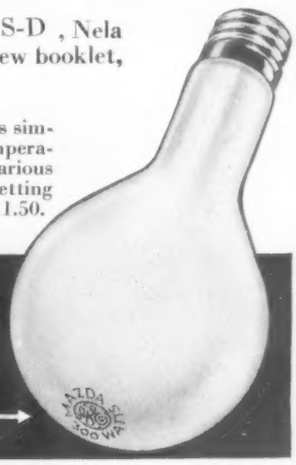
The test consists merely of recording the number of times a person blinks under various kinds of light. But it shows that nearly all of the hidden discomforts caused by poor seeing conditions are revealed by the "rate of blink!"

Thanks to lighting research of this type, the kind and amounts of light needed for performing various industrial processes efficiently and with a minimum of eyestrain, can easily be determined. With a G-E Light Meter, you and your shop foreman and plant superintendents can measure the light accurately.

Important to the success of any relighting program is the use of good lamp bulbs. Thrifty industrial purchasers buy Edison MAZDA lamps because these lamps *stay brighter longer* . . . provide more light at no additional cost for current. Use the new, brighter 1939 Edison MAZDA lamps in your plant.

Write General Electric Company, Dept. 166-S-D , Nela Park, Cleveland, Ohio, for a free copy of the new booklet, "Lighting for Production in the Factory."

A G-E Light Meter measures light as simply as a thermometer measures temperature. You can tell whether the various departments in your plant are getting enough light for safe seeing. Costs $11.50.



EDISON MAZDA LAMPS

GENERAL ELECTRIC

They stay brighter longer →

delivery with larger consuming industries placing orders for stock about in line with current operations, which in some instances are slightly lower. Buying by automobile partsmakers has slumped and household appliance manufacturers are buying sparingly. Strip prices, however, appear steadier than for some time.

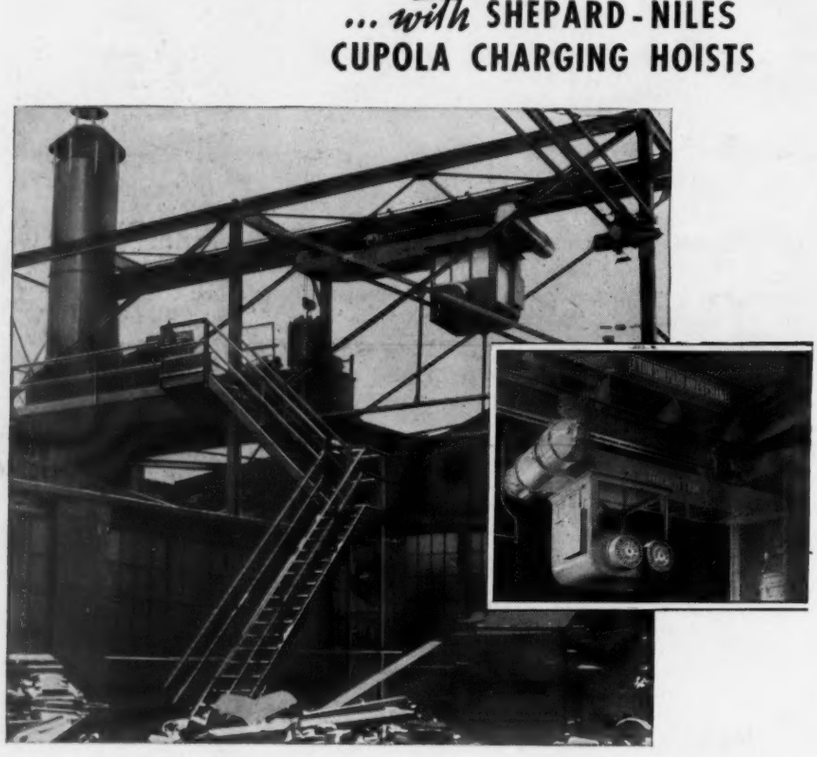
Philadelphia — Automobile body and frame production is steady, but it is indicated output of 1939 models will be continued for only about eight more weeks. This is also substantiated by reports from makers of miscellaneous parts. Makers of truck cabs and fenders are fairly busy. No test is expected for a month or two of the new price setup eliminating functional allowances to jobbers on galvanized sheets since coverage was heavy prior to the April 1 deadline.

Buffalo—Demand for sheets and strip is holding steady and is considered only fair. Automotive releases still are small.

Birmingham, Ala.—Sheets show little inclination to drop from the high rate of production evident over the past few months. Sheet production continues to lead the field, while strip, consisting mostly of cotton ties in this section, is being produced as a fill-in and not in large quantities.

BETTER CASTINGS AT LESS COST PER TON

... with SHEPARD-NILES CUPOLA CHARGING HOISTS



● Each charge is lowered in place, not dropped. Uniformly layered charges insure more even distribution of heat. Expensive charging floors are eliminated. Cupolas are charged faster and with fewer men—LESS cost per ton.

A COMPLETE LINE OF CRANES & HOISTS

SHEPARD NILES CRANE & HOIST CORP.

358 SCHUYLER AVENUE...MONTOUR FALLS, N.Y.

Plates

Plate Prices, Page 70

Cleveland—Repair work on lake boats is more active, although so far this has been without effect on plate business. Miscellaneous demand is fairly steady in small lots, while railroad buying is quiet. A substantial plate tonnage is pending for pipe to be bid this month for the Toledo, O., waterworks improvement.

Chicago—Demand for steel plates shows little change. Tank construction is prominent in plate needs. Railroad car building, which has been looked to as an increasing source of demand, has not become active.

Boston—Plate demand holds to the recent rate with some slight drop in specified work pending. Awards include a 100-ton standpipe. Oil storage tank work is missing although several large projects are under consideration. Shipyard releases are steady. Miscellaneous buying, however, is generally in small lots.

New York—Plate demand has continued quiet, following the recent award of 7500 tons for a section of the Delaware water aqueduct. Specifications for railroad equipment placed lately still are pending. Oil company specifications are light, notwithstanding the substantial refinery construction program contemplated by the industry. Tank and boiler tonnage remains spotty. American Locomotive Co., New York, is placing more than 1000 tons of plates for locomotives for the Union Pacific.

Philadelphia—Ship plate releases are none too active, but a bulge in specifications from both the Chester, Pa., and Virginia yards is seen for April. Little additional railroad buying is noted. The local locomotive works is reported figuring on export business. Demand from the West and Gulf coasts is comparatively quiet, with an inquiry from the former for 500 tons of 12-inch pipe the only outstanding inquiry. Some plate makers report miscellaneous business improving, including movement out of warehouse stocks.

Newport News Shipbuilding & Dry Dock Co., Newport News, Va., has been awarded an airplane carrier by the navy, at $31,800,000, on which it was the only bidder.

Birmingham, Ala.—Plates are in somewhat less but satisfactory volume although there is expectation of a pick-up when specifications are completed for projects now in the making.

Seattle—Shops report only fair volume of small jobs, for boilers, tanks and stacks, total below expected seasonal levels. No large projects involving plates are announced. Lake Union Dry Dock & Machine Works, Seattle, is low at $93,990 for construction of a 163 foot, shallow draft, stern wheel steamer for U. S. engineer, Seattle, involving about 200 tons.

San Francisco—Youngstown Sheet & Tube Co. is apparently low bidder on 500 tons of plates for the bureau of reclamation under invitation 33,119-A-1, for delivery at Sacramento, Calif. The Lake Union Drydock & Machine Works submitted the low bid to the United States engineer office, Seattle, Wash., at $93,990, for a snag boat 163 feet long, requiring 200 tons of plates and shapes. So far this year 14,792 tons have been awarded as compared with 12,218 tons for the corresponding period in 1938.

Plate Contracts Placed

2000 tons, 72-inch steel line pipe for waterworks improvement, Toledo, O., to Bethlehem Steel Co., Bethlehem, Pa.; bids April 12 on 15,000 tons additional of 78-inch pipe.

125 tons, 20 and 24-inch steel pipe, Marietta, O., and Paducah, Ill., delivery, United States engineer, Louisville, Ky., to American Rolling Mill Co., Middletown, O.

100 tons, four fermenter tanks, Jos. E. Seagram & Son Inc., Louisville, Ky., to Stacey Mfg. Co., Cincinnati.

100 tons, large diameter steel pipe, collecting mains, McMillan filtered water reservoir, Washington, to National Tube Co., Pittsburgh; Couse & Saunders, Detroit, general contractors.

Plate Contracts Pending

500 tons, bureau of reclamation, invitation 33,119-A-1, Sacramento, Calif.; Youngstown Sheet & Tube Co., Youngstown, O., low.

270 tons, for Sohio bulk plant at Cincinnati; also 150 tons structural shapes; bids in.

200 tons, including shapes, 163-foot stern wheel steamer for United States engineer, Seattle; Lake Union Dry Dock & Machine Works, Seattle, low.

Unstated tonnage, pipe and fittings for Coulee dam; Grimes Pipe & Supply Co., Denver, low.

Unstated tonnage, derrick hull for United States engineer, Bonneville dam; Commercial Iron Works, Portland, Oreg., low.

Steel Imports Light

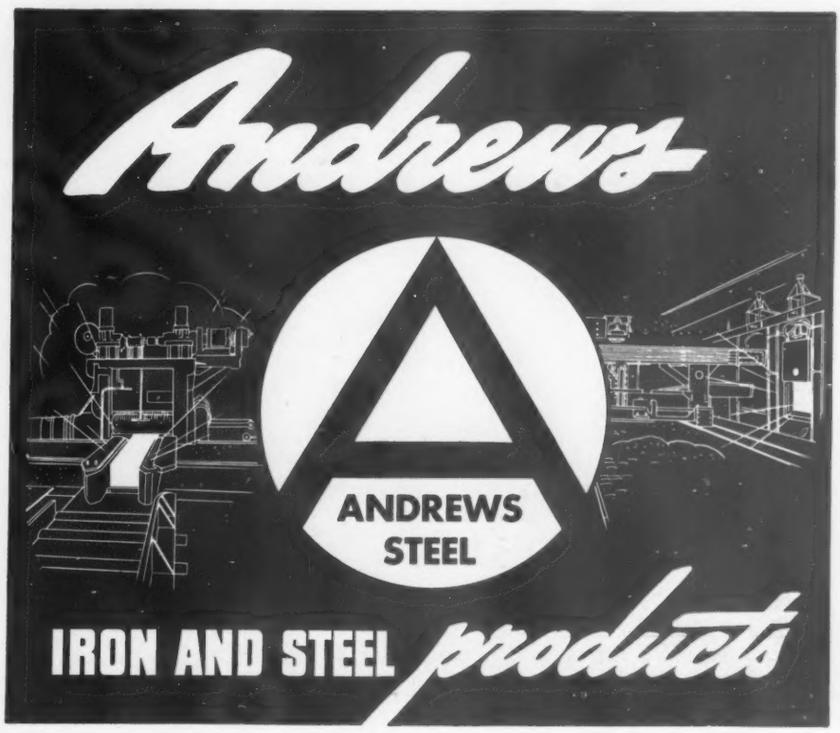
Philadelphia — Imports received during the week ending March 25 included 231 tons of structural shapes, 28 tons of steel bands and 22 tons of steel bars from Belgium, as well as 42 tons of steel tubes, 36 tons of wire rods and 6 tons of steel bars from Sweden.

Bars

Bar Prices, Page 70

Cleveland—Bar sales still are retarded by absence of heavier requirements of automotive interests. As a result, business lately has held closely to the volume a month ago. Demand from some miscellaneous users has tended upward the past several weeks, but gains are spotty and March shipments for most producers showed only a small gain over February.

New York—Plain carbon bar business continues small, with jobbers specifying lightly and railroad demand still limited. Bolt and nut manufacturers are taking material sparingly. Buying of cold drawn and alloy bars is fairly active, with sizable specifications coming from airplane, roller bearing, marine hardware and machinery interests.



After all, steel making at its best is a precision art in which the most important factor is man power. There's a knack to steel making that only the years can bring and only long experience sharpen. Here at Andrews we pride ourselves on our men and their superior steel making abilities. Every slab, bar, bloom or billet that leaves this plant bears the unmistakable imprint of each man's skill and craftsmanship. To select Andrews for your requirements is to make sure of two major essentials: (1) iron and steel products of unsurpassed quality, and (2) a wholly dependable source of supply.

In Carbon and Alloy Steels: Blooms • Forging Billets • Rerolling Billets • Slabs • Universal Mill Plates • Sheet Bars

THE ANDREWS STEEL CO.
NEWPORT, KENTUCKY
DIVISIONS
THE NEWPORT ROLLING MILL COMPANY
THE GLOBE IRON ROOFING & CORRUGATING CO.

Tendency in demand from the latter group has been upward steadily for a number of weeks.

Boston—Demand for commercial steel bars continues to drag with alloy and forging material making relatively the best showing. Few large orders are coming from jobbers, through whom a substantial volume of bar tonnage is distributed in this territory. Machine tool builders are buying steadily, generally through secondary sellers.

Chicago—Demand has leveled off, following a recent letdown. Cold-drawers have reduced requirements in some instances, and automotive ordering has lagged. Needs of farm equipment interests are sustained, however, March orders were slightly below February tonnage, although shipments were heavier, thereby curtailing backlogs. The April outlook is uncertain.

Birmingham, Ala.—Bar business is slowing down somewhat although still on a satisfactory basis. Concrete reinforcing bars are in consistent demand, and some business is materializing from manufacturers of agricultural implements.

Buffalo — Bar orders are off slightly, but this is regarded as only a temporary interruption. Reduced production results principally from lighter automotive and shape orders. An increase in the latter in the near future is thought assured.

ATLAS GAS-ELECTRIC LOCOMOTIVES

45 Ton Locomotive especially suitable for economical interplant switching service.

OTHER ATLAS PRODUCTS

Gas-Electric and Diesel-Electric Locomotives . . . Electric Transfer Cars for Blast Furnaces and Steel Plants . . . Stockhouse Scale Cars for Blast Furnaces . . . Concentrate and Calcine Cars for Copper Refineries . . . Automatic and Remote Controlled Electric Cars . . . Pushers, Levellers and Door Extractors . . . Coal Charging Lorries, Coke Guides and Clay Carriers . . . Atlas Patented Coke Quenching Cars for By-Product Coke Ovens . . . Atlas Patented Indicating and Recording Scales . . . Special Cars and Electrically Operated Cars for every conceivable Purpose.

THE ATLAS CAR & MFG. CO.

Engineers . . . Manufacturers

CLEVELAND, OHIO

Pipe

Pipe Prices, Page 71

Pittsburgh—Buying of merchant pipe is below expectations, March shipments being little changed from February except as a result of the longer month. Activity in oil country goods is disappointing. Mechanical tubing is moving steadily, principally to automotive plants. Demand elsewhere is spotty and generally unchanged. Business in boiler tubes and other pressure tubing is lighter than a month ago, although railroads indicate possibility of heavier needs later in the year.

Cleveland—Steel pipe shipments to distributors showed little change during March, although for some producers the longer month provides a small increase over February. The building industry offers most promise for heavier consumption the next few months. A few large pipe lines are being discussed, but these are not yet near the bidding stage. Jobber stocks of standard pipe approximate those on hand a year ago.

New York—Small-lot inquiry for cast pipe tends upward, although buying is slow. Yonkers, N. Y., is expected to ask bids shortly on about 800 tons, 12 to 24-inch, and a contractor is purchasing 300 tons, mostly 8-inch for Westchester county. Utilities in the East are also placing pipe orders in slightly better volume.

Birmingham, Ala. — Pipe plants are producing at a pace somewhat in excess of fourth quarter and have prospects for continued substantial tonnage, a considerable portion of it likely to come from private sources, inquiries indicate.

Seattle—Sales are small, and most inquiries are for less than 100 tons each. Quartermaster, Fort Lewis, Wash., will receive bids April 4 for 5500 feet of 10 and 12-inch cast iron pipe, totaling about 200 tons.

San Francisco—Cast iron pipe awards are limited to lots of less than 100 tons and awards so far this year total 6641 tons, compared with 8595 tons for the same period last year. National park service at Boulder City, Nev., will open bids April 11 for 303 tons.

Rails, Cars

Track Material Prices, Page 71

Small rail tonnages continue to be placed, the Virginian buying 4000 tons and the Chicago & North Western 9000 tons. No large lots are in prospect. New York Central last week opened bids on its quarterly requirements for steel. An inquiry has been issued by the navy department for 20 locomotives of various types.

Southern Pacific has placed two additional streamlined trains with Pullman-Standard Car Mfg. Co., Chicago, for service between San Francisco and Los Angeles. Cost is about $1,000,000 for each train. Locomotives have not yet been placed.

Chicago, Milwaukee, St. Paul & Pacific has asked permission to issue $1,920,000 in equipment trust certificates to finance construction of 1000 fifty-ton box cars and 75 cabooses in its own shops. Chicago, Burlington & Quincy has placed 25 diesel highway buses for use between Chicago and Los Angeles.

Pending freight car business includes 1150 for the Missouri Pacific, 600 for Denver & Rio Grande Western, 1000 for Chicago, Rock Island & Pacific and material for 1000 gondolas for Illinois Central. Early closing on these inquiries is expected.

Car Orders Placed

Southern Pacific, two streamlined passenger trains, to Pullman-Standard Car Mfg. Co., Chicago.

Union Pacific, 300 fifty-ton flat cars, to own shops, Omaha.

Rail Orders Placed

Chicago & North Western, 9000 tons; 6700 tons to Carnegie-Illinois Steel Corp., Chicago, 2300 tons to Inland Steel Co., Chicago.

Virginian Railway, 4000 tons; 3000 tons to Bethlehem Steel Co., Bethlehem, Pa., and 1000 tons to Carnegie-Illinois Steel Corp., Pittsburgh.

Locomotives Pending

Navy, 20 locomotives of miscellaneous types; bids asked.

Buses Booked

J. G. Brill Co., Philadelphia; Ten 40-passenger for Duluth-Superior Transit Co., Duluth.

Yellow Coach division, General Motors Corp.: Twenty-five 28-passenger air-conditioned diesel highway coaches, for Chicago, Burlington & Quincy railroad.

Yellow Truck & Coach Mfg. Co., Pontiac, Mich.: Thirteen super-coaches for Central Greyhound Lines Inc. and Capital Greyhound Lines; awarded subject to interstate commerce commission permission to issue equipment notes.

Wire

Wire Prices, Page 71

New York—Slight improvement in wire buying has developed during the last 10 days, but March volume was disappointing to eastern producers. Gains in specialties, notably to the wire goods manufacturing trade, are accompanied by a moderate sag in demand for spring wire and rope. Little real tonnage is coming from the automotive industry.

Boston—Wire buying shows little improvement and incoming volume with some eastern producers has declined slightly. This is reflected in finishing operations which are uneven and lower. There is no forward buying, consumers pressing for delivery. Inventories being low in most instances, the trend in buying indicates aggregate consumption has been declining.

Cleveland — A decrease during March in merchant wire products

Profits Drip Away

From bearings where wasteful liquid oil is used. Cost of lubricant is high and the need of frequent application adds to the expense. What's more, there is no assurance of positive protection from dangerous frictional wear.

Elimination of such troubles plus a decided saving is realized by using NON-FLUID OIL. Dripless, and wasteless, NON-FLUID OIL stays in bearings, lubricating dependably until entirely consumed. Keeps machines in steady operation at lowest maintenance cost. Saves money on lubricant and application cost by outlasting oil 3 to 5 times.

Send for testing sample today-prepaid. NO CHARGE!

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MODERN STEEL MILL LUBRICANT

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business largely was the result of prior coverage. Producers look for improved consumption of barbed wire, fence, etc. in farm districts this year compared with 1938. Lawn fence has been advanced $2 a ton. while prices of other wire products are reported the firmest in a number of months.

Semifinished

Semifinished Prices, Page 71

Pittsburgh—Demand for semifinished steel shows little change. Nonintegrated mills continue to buy only for early needs and are maintaining small stocks. Tonnage varies widely from week to week, although the trend has been downward lately because of the decline in sheet specifications. Sheet bars continue the most active item, however, aided by an increase in tin plate production.

Tin Plate

Tin Plate Prices, Page 70

Tin plate demand is gaining, though improvement in some instances has been below expectations. Nevertheless, the outlook is regarded fairly promising. Buying will start shortly for plate for the earlier crops, and releases against standing orders are expected to give a further boost to production, which now stands at 60 per cent.

Estimates have placed the increase in tin plate production this year over 1938 at 10,000,000 boxes. This would place output about 40,000,000 boxes but well below the record of 54,000,000 base boxes.

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Shapes

Structural Shape Prices, Page 70

Pittsburgh — Awards are fairly light, with a good sprinkling of private jobs in the list. New projects announced continue active, although most are relatively small. Privately financed projects are also fairly numerous in the new inquiries. Largest of the new placements involves 1100 tons for caissons to be used in a bridge for the New Hampshire & Maine at Portsmouth, N. H. This was awarded to Turl Engineering Works.

Cleveland — Private work has failed to develop as anticipated, although there has been slight improvement in small private jobs. Fabricators are fairly busy on public projects. Outstanding recent award went to Bethlehem Steel Co., Bethlehem, Pa., involving 850 tons, for the Toledo Scale Co. factory building, Toledo, O. Great Lakes Dredge & Dock Co., Cleveland, is low on 1800 tons of piling, for cut 4A, Cuyahoga river straightening project, here. Little improvement in prices has been noted.

Chicago—New demand indicates a measure of improvement, with substantial tonnages already pending and several large projects due for closing soon. Over 4500 tons are involved in projects to be read in the Chicago district this week. Largest of these is the south side vocational school, for which the board of education will receive bids April 4, involving 3000 tons. Board of local improvements, Chicago, will receive bids on a tunnel construction at Wrightwood avenue, April 3.

Boston—Although one district structural shop booked 450 tons for a school addition, most of the limited tonnage for fabricated material is going to outside shops. This is especially true of bridge work, there being no shop in this area figuring bridges. Vermont has bids on better than 500 tons, mostly small I-beams, part of which has

been placed through contractors.

New York—Financing, which appears assured, and favorable action by the war department, also likely, remain to be accomplished before preliminary action on the proposed $41,000,000 Battery Park-Brooklyn bridge will be taken. The main crossing will consist of two large suspension bridges with a pier in the harbor north of Governor's Island. Meanwhile structural activity is light with new inquiry coming out slowly, although bridges in New Jersey closing April 14 take close to 700 tons.

Fabricated steel contracts closed during February totaled only 77,036 tons, according to reports received by the American Institute of Steel Construction. This represents a substantial decline from the 101,559 tons booked during January, but remained substantially above the 57,144 tons placed during February, 1938. Bookings for the first two months this year were approximately 130 per cent of tonnage placed during the comparable period in 1938. Shipments during both February and January of this year were slightly less than the new orders, indicating a growth in backlogs. Totals for the first two months are: Bookings, 178,595 tons, shipments 168,065 tons. This compares with 137,464 and 168,924 tons respectively.

Buffalo—Continued flow of school projects is keeping most fabricators here busy, although aggregate tonnage of awards is only moderate. General contracts have been announced on many projects, but the awards are slow in closing.

Philadelphia—Little change has developed in the structural market. The only favorable development has been appearance of more private work. Prices continue weak with some work reappearing for new bids.

Seattle—New projects are developing slowly and immediate prospects are not promising. Larger plants have a fair volume under way. Week's largest award, 500 tons or more for power line towers over the Columbia river for the Bonneville authority, went to the Lehigh Structural Steel Co., Allentown, Pa. Schmitt Steel Co., Portland, will furnish stoplogs for the Coulee dam project, involving 195 tons.

San Francisco—Only three new inquiries developed during the week and aggregated less than 600 tons. Pending business involves less than 3500 tons. Awards totaled 2082 tons and brought the year's aggregate to 35,396 tons, compared with 24,440 a year ago.

Shape Awards Compared

	Tons
Week ended April 1	**32,489**
Week ended March 25	**15,840**
Week ended March 18	**22,227**
This week, 1938	**17,510**
Weekly average, year 1938	**21,566**
Weekly average, 1939	**25,437**
Weekly average, February	**17,123**
Total to date, 1938	**193,694**
Total to date, 1939.....	**305,242**

Includes awards of 100 tons or more.

Shape Contracts Placed

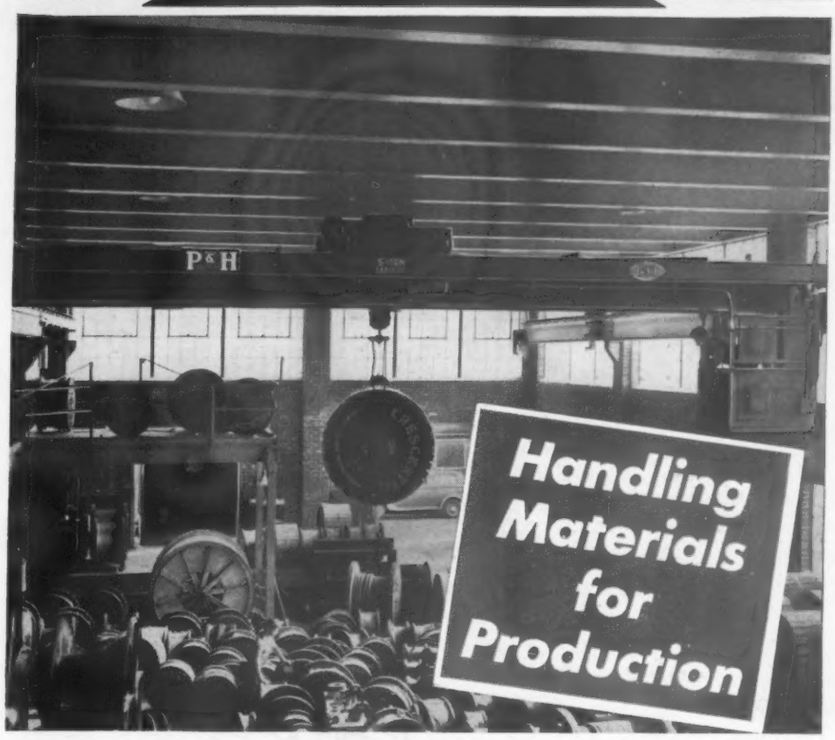
9000 tons, sheet piling, substructure, bridge, Popes Creek, Md., to Carnegie-Illinois Steel Corp., Pittsburgh; through Merritt-Chapman & Scott, New York. Also 1400 tons of forms and protection plates for the same project to Carnegie-Illinois Steel Corp.

4000 tons, bridge, Seattle, to Pacific Car & Foundry Co., Seattle, through Puget Sound Construction Co., Seattle.

2000 tons, sheet piling, Greenville, Miss., substructure for bridge across Mississippi river, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

1100 tons, caissons for bridge, Portsmouth, N. H., for New Hampshire and Maine, to Turi Engineering Works.

P&H TRAV-LIFT CRANES



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1000 tons, state hospital building, Staten Island, N. Y., to Belmont Iron Works, Philadelphia; through Caye Construction Co., New York.

990 tons, curb angles, department of purchase, New York, to American Bridge Co., Pittsburgh.

850 tons, factory and office building, Toledo Scale Co., Toledo, O., to Bethlehem Steel Co., Bethlehem, Pa.

845 tons, transmission towers, Houston Lighting & Power Co., Houston, Tex., to Emsco Derrick & Equipment Co., Houston.

663 tons, highway bridge, Georgetown, Tex., to Virginia Bridge Co., Roanoke, Va.

650 tons, Delaware aqueduct, contract 321, Carmel, N. Y., to American Bridge Co., Pittsburgh.

560 tons, Isolation hospital, medical center, Jersey City, N. J., to Lehigh Structural Steel Co., Allentown, Pa.

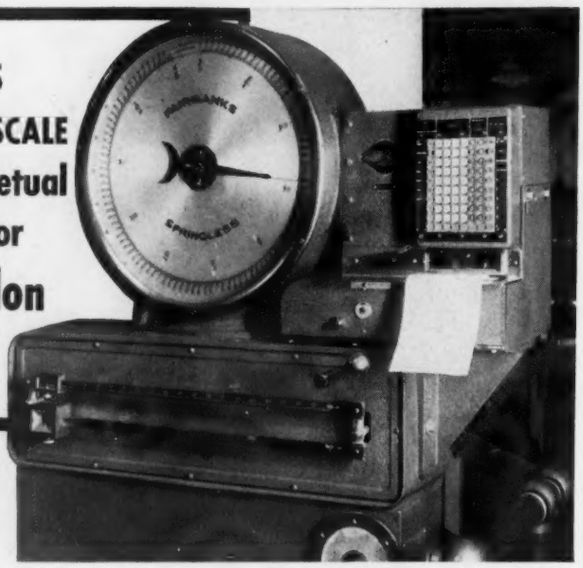
500 tons or more, 14 high crossing towers, for Bonneville authority, to Lehigh Structural Steel Co., Allentown, Pa.

460 tons, contract D4, Dearborn street subway, Chicago, to American Bridge Co., Pittsburgh.

450 tons, additions Cambridge High and Latin school, Cambridge, Mass., to New England Structural Co., Everett, Mass.; Rugo Construction Co., Boston, general contractor.

450 tons, head frames, Delaware Aqueduct, contract 313, New York, to Archer Iron Works, New York.

FAIRBANKS PRINTOMATIC SCALE Maintains Perpetual Inventory for Parker-Kalon Corp.



The weighing unit at Parker-Kalon consists of a Fairbanks 6000-lb. all-metal self-contained warehouse scale with cabinet dial, Printomatic Weigher, and tare beam.

A Fairbanks Printomatic scale provides a complete, printed record of each stock room transaction for the Parker-Kalon Corporation of New York City. It makes a printed record that shows the *weight of material, source of supply, size of material, number of pieces,* and whether the material is *incoming* or *being withdrawn.* All of this information is automatically printed on a roll tape by the Fairbanks Printomatic. At the end of each day, the tape is used by the purchasing and auditing departments to check incoming shipments and maintain a perpetual inventory. There are no hastily scrawled records to decipher—no incorrect readings to throw the accounting system out of balance. Little errors in weight reading and recording that could add up to big losses are practically impossible in this plant.

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415 tons, Cuyler school, Trenton, N. J., to Bethlehem Steel Co., Bethlehem, Pa.; through N. A. K. Bugby Co., Trenton, N. J.

410 tons, 13-story apartment, Madison avenue-Seventy-third street, New York, to Dreier Structural Steel Co., New York.

380 tons, bridge, proj. 262D, Powder River, Montana, to Missouri Valley Bridge & Iron Co., Leavenworth, Kan.

370 tons, underpass material, Baltimore & Ohio railroad, Lorain, O., to Carnegie-Illinois Steel Corp., Pittsburgh.

330 tons, alterations to cupolas, production foundry, Ford Motor Co., Detroit, to Taylor & Gaskin, Detroit.

327 tons, highway bridges, Collins county, Texas, to Mosher Steel Co., Houston, Tex.

315 tons, Fort Greene health center, Brooklyn, to Weatherly Steel Co., New York; through Sheppard-Pollock Co., New York.

315 tons, Central junior-senior high school, Hyde Park, N. Y., to Belmont Iron Works, Philadelphia.

310 tons, maintenance buildings, No. 10 and 11, city of Cleveland, to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, school, Each park, Poughkeepsie, N. Y., to Belmont Iron Works, Philadelphia.

295 tons, state bridges, Trumbull and Westport, Conn., to American Bridge Co., Pittsburgh; through Mariani Construction Co., New Haven.

260 tons, building, Newport Rolling Mill Co., Newport, Ky., to International Steel Co., Evansville, Ind.

250 tons, reconstruction, Berkley street bridge, Boston, to American Bridge Co., Pittsburgh.

235 tons, office and warehouse building, St. Louis, to Mississippi Valley Structural Steel Co., Decatur, Ill.

235 tons, state highway bridge FAGS-18, Letcher county, Kentucky, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

235 tons, high school, Norwalk, O., to Klein Steel Co., Bellevue, O.

230 tons, bottling plant, Coca-Cola Co., Philadelphia, to American Bridge Co., Pittsburgh; through Wark Co., Philadelphia.

230 tons, additions, building 72, American Magnesium Corp., Cleveland, to American Bridge Co., Pittsburgh.

220 tons, bridge FAGM-H-289, Uvalde county, Texas, to Austin Bros., Dallas.

220 tons, alterations and garage, General Baking Co., New York, to Bethlehem Fabricators Inc., New York; through Equity Construction Co., New York.

205 tons, bridges, Quincy, Ill., Chicago, Burlington & Quincy railroad, to Joseph T. Ryerson & Son, Inc., Chicago.

200 tons, warehouse, Anchor Hocking Glass Corp., Salem, N. J., to Belmont Iron Works, Philadelphia.

200 tons, stadium, Massillon, O., to American Bridge Co., Pittsburgh.

200 tons, high school, Hamburg, N. Y., to Ernst Iron Works Inc., Buffalo.

195 tons, stop logs for Coulee dam, to Schmitt Steel Co., Portland, Oreg.

190 tons, spec. 1187D, bureau of reclamation, Boulder City, Nev., to International Derrick & Equipment Co., Columbus, O.

180 tons, Dauphin county hospital, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

170 tons, bus structure, specification 1187-D, Boulder City, Nev., to International Derrick & Equipment Co., Los Angeles.

165 tons, school, Lynbrook, N. Y., to Bethlehem Fabricators Inc., New York; through Andrew Weston Co., New York.

160 tons, auditorium, Marina junior high school, San Francisco, to Golden Gate Iron Works, San Francisco.

140 tons, addition to high school, Cort-

land, N. Y., to American Bridge Co., Pittsburgh.

115 tons, warehouse, Kroehler Co., Dallas, Tex., to Mosher Steel Co., Dallas.

115 tons, H columns, bridge, Guerneville, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

114 tons, for Sand Point, Seattle, naval air station, to Midland Structural Steel Co., Chicago.

110 tons, Rines Hill grade crossing over Maine Central railroad, Augusta, Me., to American Bridge Co., Pittsburgh.

110 tons, signal bridges, Chesapeake & Ohio railway, Barboursville to Peach Creek, W. Va., to American Bridge Co., Pittsburgh.

110 tons, rollerdrome, Western Hills Rolatorium, Inc., Cincinnati, to William Lang & Sons Co., Cincinnati.

105 tons, spec. 1196D, bureau of reclamation, Loveland, Colo., to Joseph T. Ryerson & Son Inc., Chicago.

105 tons, undercrossing of Southern Pacific tracks, Riverside county, California, to unnamed interest.

100 tons, school addition, Wilmington, O., to Champion Bridge Co.

100 tons, central school, East Penbrook, N. Y., to F. L. Heughes & Co. Inc., Rochester, N. Y.

Shape Contracts Pending

3000 tons, board of education, south side vocational school, Eighty-seventh street and Jeffery avenue, Chicago, bids April 4.

1800 tons, piling, Cut 4A, Cuyahoga river straightening project, Cleveland; Great Lakes Dredge & Dock Co., Cleveland, low.

1200 tons, garage, 215th street, New York, bids to procurement division, treasury department, New York.

1200 tons, infirmary buildings, Willowbrook, N. Y., for state.

1000 tons, hospital building, Staten Island, N. Y.; Caye Construction Co., New York, low.

1000 tons, municipal pumping station, Chicago.

940 tons, underpass construction, Dalhart, Tex., bids in.

700 tons, Laramie avenue viaduct, Morris Handler & Co., Chicago, low bidder on general contract.

435 tons, state bridge, Bloomington, Ill.

425 tons, Teton river bridge, Teton county, Montana; bids opened.

420 tons, steel structures, substation, Bonneville dam, Oreg.; Bethlehem Steel Co., San Francisco, low.

400 tons, piling, Erie avenue and East Twenty-first street bridges, Lorain, O.; Great Lakes Dredge & Dock Co., Cleveland, low, also includes 230 tons of bars.

400 tons. high school, Clyde, N. Y.; bids April 7.

378 tons, four span bridges, route 6, sections 8 and 9, Clifton, N. J.; bids April 14, E. Donald Sterner, state highway commissioner, Trenton, N. J.

375 tons, highway bridge, Miles City, Mont., bids in.

365 tons, viaduct, Fairbury, Nebr., for state.

350 tons, office and garage, state of New Jersey, Newark; bids April 14.

350 tons, housing project, Chatham Park Inc., Chicago.

303 tons, bridge, six plate girder spans, about 325 feet, over Delaware, Lackawanna & Western railroad, Mountain View, N. J.; bids April 14, E. Donald Sterner, state highway commissioner, Trenton, N. J.

300 tons, dumping platform and shed, pier 99, New York.

300 tons, state bridge, Marble Cliff, O.

250 tons, bridge over Mississippi river, Moselle, Mo., St. Louis-San Francisco railway.

250 tons, mill building, Andrews Steel Co., Newport, Ky.

250 tons, state bridge, FAP-237-D, Bonner, Mont.

235 tons, state bridge over Shetucket river, Norwich, Conn.

235 tons, superstructure, Hiwassee power house, Turtleton, Tenn., for TVA.

224 tons, bridge, Brady, Tex., bids in.

220 tons, Mills bridge, Tillamook county, Oregon; bids April 7.

215 tons, state highway bridge, Nallen, W. Va.

208 tons, board of local improvements tunnel construction, Wrightwood avenue, Chicago, bids April 3.

200 tons, alterations to high school, Lynbrook, N. Y.

200 tons, seven temporary foot bridges, track elevation project, Winnetka, Ill., bids April 4.

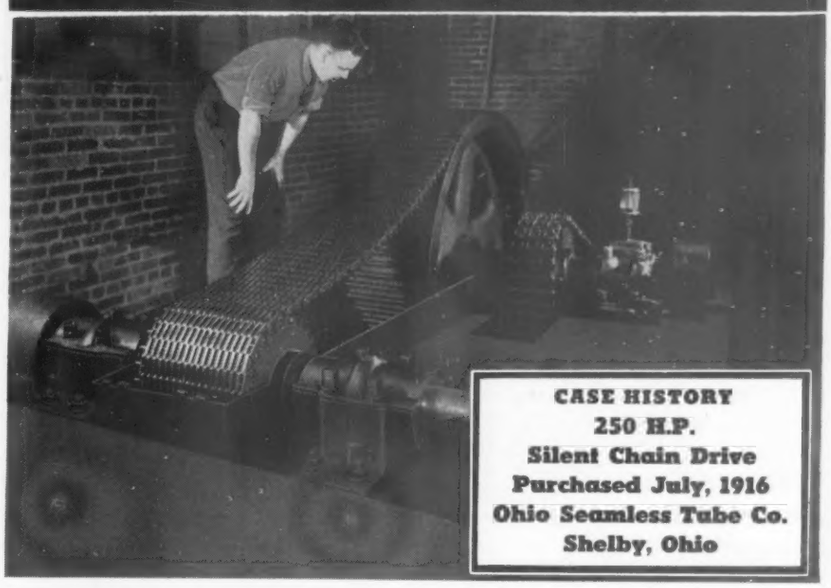
195 tons, men's dormitory, Ohio state university, Columbus, O.

180 tons, Chippewa street underpass, St. Louis; Stiers Construction Co., St. Louis, low.

175 tons, women's dormitory, Miami university, Oxford, O.

175 tons, state bridge, Columbus, O.

SILENT CHAIN PERFORMANCE FACTS



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Behind the Scenes with STEEL

Progeny

■ Over in the Bronx Zoo last week there came into this hectic world two little creatures known as *aoudads,* which our secret operatives tell us are wild sheep of north Africa. This happy event, although perhaps unusual, would no doubt have escaped our bleary eye but for the fact that one John Toomey, keeper of the Zoo, tenderly patted each little aoudad on the head and christened them *Etaoin* and *Shrdlu,* which casts an entirely different light on the whole thing, as you can see. When quizzed on the affair Mr. Toomey admitted he couldn't pronounce either name (*imagine!*) but said he thought they were particularly appropriate for two newly born aoudads. Hardly had Mr. Toomey done his deed than Typographical Union No. 6 of the metropolitan region hopped up to say they figured they had exclusive rights to these monikers and at the moment we are knee-deep in lawyers trying to figure out our own next move. Any suggestions?

Are You A Snake?

■ Revere Copper & Brass, Inc. has been getting out a series of very clever employes' letters, designed to keep Revere workers better informed on the policies and business of the company. Letter No. 5, just out, tells the story of Revere and the U. S. Navy, including some samples of sea going slang. *Skag,* they say, is a coffin nail or cigarette; *Red Eye* is catsup to you; *Seaweed* is the Navy's apology for spinach; and a *Snake* a nautical lady-killer.

A Bit Mossy

■ A reader who prefers to shroud his identity, because he always digs up stories that came over on the Mayflower, sends in the wheeze about London's famous "Big Ben". An American tourist was listening to the deep, sepulchral tones of the historic bell, and as he stood, lost in reflection, a bedraggled subject of George VI shuffled up alongside, motivated to make a small touch. "Ain't that there bell a wonder?" said the subject, opening the conversation. "What say?" said the pilgrim, cupping his ear. "Hi say," resumed the bedraggled one, "Ain't

that there bell a wonder? Listen to them tones—" "You'll have to speak louder," bellowed the tourist, "I can't hear a word you're saying on account of that damn bell!"

Special Feature

■ Next week in STEEL there will appear the most complete story on sponge iron that has ever been published. It will run as a special 12-page insert and if you want any additional copies a few will be available but we suggest you get your request in early.

Mike the Mischievous

■ A case of the National Labor Relations board, initiated back in 1937 against the Cincinnati Milling Machine Co., has been settled out of court. The complainant, who is a former employe and president of the C.I.O. local at the plant, had a lot of nerve ever starting the case with the name he has: *Mike Mischeff.*

Some Specs

■ Maybe you can blame this story on those few "spring-fever" days last week. It seems this fellow had been troubled with spots before his eyes so he went to see an optometrist, who assured him he could fix everything with a pair of specs which would be ready the following day. And the next day when our friend tries the glasses on the optometrist asks: *There, isn't that better?* to which the screwball replies: *Oh yes, that's swell. I can see the spots a lot plainer now!*

SHRDLU

175 tons, state bridge, Rock Falls, Ill.

170 tons, beam bridge over Boston & Maine railroad, Bernardstown, Mass., for state.

156 tons, state girder bridge, King county, Washington; bids to Olympia, April 11.

153 tons, state undercrossing, Seattle; bids to Olympia, April 11.

145 tons, factory building, Liberty Cherry & Fruit Co., Covington, Ky.

140 tons, Remsen avenue bridge, Los Angeles; bids soon.

140 tons, viaduct, Murray, Nebr., for state.

135 tons, bridges, Missouri Pacific railroad, in Missouri and Kansas.

125 tons, beam bridge over New York, New Haven & Hartford railroad, Bellingham, Mass., for state.

115 tons, fat rendering plant, Wilson & Co., Philadelphia.

Unstated tonnage, two 5-span steel and concrete state spans; bids in at Helena, Mont.

Reinforcing

Reinforcing Bar Prices, Page 71

Pittsburgh—New projects involving tonnages above 100 tons are few. There is still fair activity in smaller jobs, but currently the chief activity is confined to placements on large tonnages still pending. Clark Valley dam, near Harrisburg, Pa., calls for 300 tons. Prices are still holding relatively firm in most sections.

Cleveland—Public work continues to dominate reinforcing awards and inquiries, although some improvement in private projects involving tonnages under 50 tons has developed. A number of school projects are scheduled to appear for bids within the next 30 days. Great Lakes Dredge & Dock Co., Cleveland, is low on 500 tons for the substructure Erie avenue and East Twenty-first street bridges, Lorain, O. Prices continue weak.

Chicago—Recent closings and inquiries involve no new projects over 100 tons, but an unusually substantial accumulation of tonnage is still pending, with small jobs comprising a large part of this demand. Backlogs continue sizable, with some quarters reporting difficulty in making the required prompt deliveries. One interest estimates March shipments were the highest in the last ten years. Private construction is tending upward rapidly, although its requirements usually are small individually. Chicago subway construction continues to be the largest single source of demand, with another section scheduled to be bid April 6, and several more sections expected out for estimates shortly.

New York—Reinforcing bar tonnage up for bids or pending is heavier, led by 3000 tons for a sec-

tion of the East river drive, New York, closing April 3. Awards include 315 tons for a Circumferential highway section, New York. For a bridge approach over Highbridge park, New York, bids are in on 1550 tons. Concrete bar prices tend to be slightly steadier.

Philadelphia—Mills have experienced a moderate increase in demand from fabricators to replenish depleted inventories. This is considered as reflecting a rising volume of small jobs, as large projects continue scarce. Prices on fabricated material are still easy.

Seattle—Requirements of Coulee dam featured the reinforcing market this week. Aside from federal buying, demand is slow and no large jobs are out for figures. Reclamation bureau, Denver, has awarded 2590 tons to Bethlehem Steel Co. This order will likely be rolled at the Seattle plant. Same office on March 24 opened bids for 2220 tons of round and square bars for the Coulee project.

San Francisco—While demand, generally, has fallen off sharply during the past week or two, the reinforcing bar market was the most active one with 4147 tons booked. This brought aggregate for the year to 55,724 tons compared with 24,459 in 1938. Included among the larger lettings was 679 tons for a crossing in Berkeley, Calif., secured by Columbia Steel Co., San Francisco. Few new inquiries came into the market for figures and the largest one does not call for more than 135 tons. Total pending business aggregate a little over 5700 tons.

Reinforcing Steel Awards

2590 tons, material for Coulee dam, to Bethlehem Steel Co., San Francisco.

1100 tons, bridge, Popes Creek, Maryland, to Carnegie-Illinois Steel Corp., Pittsburgh.

800 tons, warehouse, United States Tobacco Co., Richmond, Va., to Truscon Steel Co., Youngstown, O.; through John Felmley, Bloomington, Ill., contractor.

725 tons, post office garage, St. Louis, to Laclede Steel Co., St. Louis; J. S. Alberici, St. Louis, contractor.

679 tons, University avenue crossing, Berkeley, Calif., to Columbia Steel Co., San Francisco.

541 tons, post office and court house, Fresno, Calif., to Ceco Steel Products Corp., San Francisco.

500 tons, East side high school, Rockford, Ill., to Joseph T. Ryerson & Sons, Chicago.

500 tons, five barrack buildings, Fort Clayton, Canal Zone, to Bethlehem Steel Exporting Co., New York; Robert E. McKee, El Paso, Tex., general contractor. Western Ornamental Iron Works, Los Angeles, awarded 50 tons, structural steel.

492 tons, five highway bridges, Passaic county, New Jersey, to Bethlehem Steel Co., Bethlehem, Pa.; Ell-Dorer Contracting Co., contractor.

475 tons, library, Toledo, O., to Pollak Steel Co., Cincinnati; Frank Messner & Sons, Cincinnati, contractors.

400 tons, sewage plant, Stevens Point, Wis., to Joseph T. Ryerson & Sons, Chicago.

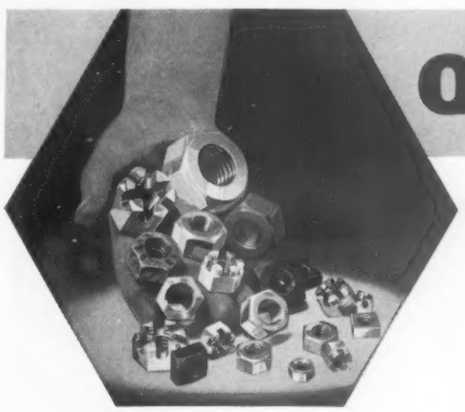
315 tons, contract MC-39-7, circumferential highway, New York, to Igoe Bros., Newark, N. J.; through Elmhurst Contracting Co., New York.

310 tons, contract 4, East river drive, New York, to Fireproof Products Co., New York; through Del Balso Construc-

Concrete Bars Compared

	Tons
Week ended April 1.....	11,872
Week ended March 25	9,113
Week ended March 18	8,558
This week, 1938	3,173
Weekly average, year, 1938	6,959
Weekly average, 1939.....	11,911
Weekly average, February.	8,268
Total to date, 1938	66,079
Total to date, 1939.....	142,937

Includes awards of 100 tons or more.



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9020

tion Co., New York.

300 tons, apartment, Wells street, Milwaukee, to Truscon Steel Co., Youngstown, O., through W. H. Pipkorn, Milwaukee.

250 tons, Central grade and high school, Cortland, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Kraft & Detor, Syracuse, N. Y., contractors.

250 tons, bridge, Cherry street, Milwaukee, to Youngstown Sheet & Tube Co., Youngstown, O., through Worden-Allen Co., Milwaukee.

225 tons, auditorium, E. Lansing, Mich., to Capitol Steel Corp., Lansing, Mich.

200 tons, sewage disposal plant, Pontiac, Mich., to Pollak Steel Co., Cincinnati.

160 tons, sewage treatment plant, Franklin, Pa., to Fort Pitt Bridge Works, Pittsburgh; Couse & Sanders, Detroit, contractors.

150 tons, factory building, for King-Seeley Corp., Ann Arbor, Mich., to Joseph T. Ryerson & Sons, Chicago; W. E. Wood Co., contractor.

145 tons, school, Weehawken, N. J., to Ceco Steel Products Co., Jersey City, N. J.; through Auf De Heide Co., Union

135 tons, bureau of reclamation, Denver, spec. A-33835-A, to Columbia Steel Co., San Francisco, for delivery at Beuna, Wash., bids March 8.

120 tons, court house addition, Huntington, W. Va., to West Virginia Rail Co., Huntington, W. Va., through Engstrom & Wynn, contractors.

110 tons, superstructure, machine shop, Mare Island navy yard, Calif., to W. S. Wetenhall Co., San Francisco.

100 tons, men's and women's dormitories, Ohio university, Athens, O., to West Virginia Rail Co., Huntington, W. Va., Robert H. Evans Co., Columbus, contractor.

100 tons, gymnasium and auditorium, Decatur, Ill., to Laclede Steel Co., St. Louis. (WPA)

100 tons, Central high school, Corfu, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, building, Phillips Pump & Tank Co., Cincinnati, to Jones & Laughlin Steel Corp., Pittsburgh; through Parkway Construction Co., Cincinnati.

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Reinforcing Steel Pending

3000 tons, contract 6, East river drive, New York; bids April 3.

2220 tons, for Coulee dam; bids in to Denver.

1550 tons, New York approach, northerly portion, Harlem river speedway-George Washington bridge connection, Highbridge Park, New York; Northeastern Construction Co., New York, low.

1000 tons or more, Ballard bridge reconstruction, Seattle; bids to city in April.

950 tons, science building, junior college, San Francisco; Clinton Construction Co., San Francisco, general contractor.

500 tons, substructure, Erie avenue and East Twenty-first bridge, Lorain, O.; Great Lakes Dredge & Dock Co., Cleveland, low.

460 tons, Joplin, Mo., viaduct; Garrett Construction Co., Springfield, Mo., low.

300 tons, Clark valley dam, Harrisburg, Pa.

248 tons, St. Louis, Chippewa street underpass; Stiers Construction Co., low.

200 tons, Carrville, La., addition to Marine hospital; Raisler Engineering Co., New York, low.

200 tons, high school, Clyde, N. Y.; bids April 7.

185 tons, four bridges, route 6, sections 8 and 9, Clifton, N. J.; bids April 14, E. Donald Sterner, state highway commissioner, Trenton.

132 tons, Arroyo de la Laguna bridge, Alameda county, California; bids April 12.

115 tons, alterations and additions to commissary building, Horn & Hardart, Philadelphia.

103 tons, library and administration building, University of California, Davis, Calif.; Carl N. Swenson Co., San Jose, Calif., general contractor.

101 tons, Long Valley dam, Los Angeles; bids April 18.

100 tons, plate girder bridge over Delaware, Lackawanna & Western railroad, Mountain View, N. J.; bids April 14, E. Donald Sterner, state highway commissioner, Trenton.

Unstated tonnage, steel and concrete state span, Powder river, Mont.; Wm. P. Roscoe, Billings, Mont., general contractor.

Pig Iron

Pig Iron Prices, Page 72

Pittsburgh — March pig iron shipments were about equal to February, but on a daily basis were lower. Some foundries still are taking delivery against low-price contracts placed last fall. Prices are steady on new business. The coke market is weak, with demand lately tending downward. Production of pig iron and coke shows little change.

Cleveland—Except for the margin of the month's extra days, March pig iron shipments held closely to the February movement. Foundry operations tended upward gradually the past 30 days, however, and there are expectations of heavier deliv-

eries in April. Improvement in the melt has been well diversified, although output of automotive castings has changed little. New business has increased slightly with the opening of third quarter books but still is restricted by tonnage not yet shipped against old contracts.

Chicago—Shipments in March were about 3 per cent improved over the previous month, and almost identical with January figures. A marked improvement was made in actual sales, however, but present ordering is spotty. Foundry melt is unchanged in recent weeks, as evidenced by the unvarying rate of by-product foundry coke shipments. Automotive and agricultural castings demand continues a prominent support. Railroad business has yet to assert itself.

Boston—Pig iron buying has slackened, demand being confined mostly to small spot lots while shipments against contracts are barely maintained with little change in foundry melt. Consumption by steelworks also tends downward. The Everett furnace will probably go in blast about May 1.

New York—Sales are light and unchanged. Consumer stocks generally are low, except for a few of the larger users. Demand from machine foundries is perhaps outstanding but is spotty. Export inquiry is light. The New York state barge canal will open its navigation season about April 12, permitting water movement from the Buffalo furnaces.

Philadelphia—A district merchant interest is planning tentatively to blow in a stack in April, since some grades of iron are depleted. March shipments were ahead of both February and a year ago, but new buying is mostly in carlots.

Twenty seven Philadelphia district foundries had 2606 tons of pig iron on hand March 1, a decline of 7.7 per cent from a month ago and 36 per cent from a year ago. Operations currently are estimated at 55-60 per cent. Stocks in the Reading area also are low.

Buffalo — Shipments are slow to expand, but producers express confidence over the outlook. Orders are sufficient to absorb output maintained at 57 per cent of capacity. Foundry operations vary, and although some jobbing plants are working five days weekly, the average for the district is around three days.

Cincinnati — Shipments of pig iron in March showed no improvement over February. Consumers are not building inventory and, in many cases, are specifying only on urgent need. Considerable contracting for second quarter has been done but most of the tonnage was for minimum requirements and placed with customary suppliers.

St. Louis — Pig iron buying is quiet but most melters have made second quarter commitments. Shipments are holding up well, a small gain being shown for March over February. Farm equipment builders, operating at a good rate for some time, are reported somewhat uncertain as to future schedules.

Birmingham, Ala.—Pig iron production has been tapered to meet decreased operating schedules in the open-hearth division with the result that 14 blast furnaces are in this week. One was taken off by Tennessee Coal, Iron & Railroad Co. early last week.

Toronto, Ont. — While some inquiries have appeared, second quarter contracting is slow. Demand is principally in small spot sales. Deliveries average about 1200 tons weekly. Three blast furnaces now are active.

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Scrap

Scrap Prices, Page 74

Pittsburgh — Scrap prices tend to soften, although no buying has appeared to support changes in mill quotations. Open-hearth grades are more plentiful, and in covering contracts for No. 1 steel, supplies at $15.75 have increased. Odd cars are reported moving at $15.50, returning the range on this grade to $15.50 to $16. One mill has inquired for No. 1 steel at $15.50, with no takers. Most orders still outstanding were placed at $16.

Cleveland—Buying of steelmaking scrap continues at a minimum and shipments are held to consumers' needs. Railroad offerings are small. Several minor grades have been advanced 50 cents to $1 per ton to bring them into line with more active grades. Prices are unchanged in the Youngstown district.

Chicago — Prices generally are steady, but lack of trading interest on the part of dealers and brokers gives indications of some softness in heavy melting steel. Brokers are sufficiently well covered to require little additional tonnage for several weeks. Prospects for renewed demand from mills are clouded by the recent letdown in district steelmaking.

Boston—Domestic demand for scrap, both New England and Eastern Pennsylvania delivery, continues dull with prices unchanged on practically all grades. Most No. 1 cast is being picked up by nearby foundries with $12.50, delivered, generally paid. Steelworks are buying little with indications ingot production will decline at one works.

New York—Although a few scattered cargo lots have been bought by representatives of the European scrap cartel now in this country no tonnage business has been placed, due to differences as to prices. On the small lots slightly higher prices are reported, close to $16, f.a.s. One member of the British delegation has returned and the others will sail in a few days. Domestic prices are generally unchanged and most Eastern Pennsylvania steel mills are taking small shipments, with buying light.

Philadelphia—Two members of the European scrap cartel committee have returned home, and it is understood no orders were placed in this country. So far this has been without effect on prices, nor is a reaction expected, especially in view of the continued heavy movement to Japan. March exports from Philadelphia alone were more than 2000 tons, about 90 per cent of which was for Japan. Brokers' offering prices on export tonnage are understood to range to $15.50 for No. 1, but No. 2 is easier with some available at $13 and $13.25. Domestic prices are firm, with specialties and machine turnings up 50 cents. Eastern mills are charging a larger percentage of turnings. Heavy cast is an exception to current firmness. E. G. Budd Mfg. Co. took bids March 31 on 3400 tons of new compressed sheets.

Buffalo — The market is steady despite absence of new sales. Dealers and consumers still are unable to agree on prices, and No. 1 steel nominally continues $13.75 to $14.25. An occasional sale of cast scrap is reported at $15 to $15.50 for No. 1 and $14.50 to $15 for cupola.

Birmingham, Ala.—Scrap is especially inactive in all major grades, but with about the average movement of No. 1 cast and some scattered lots of heavy melting.

Detroit—Scrap prices are unchanged, pending the outcome of bidding on recent automotive lists.

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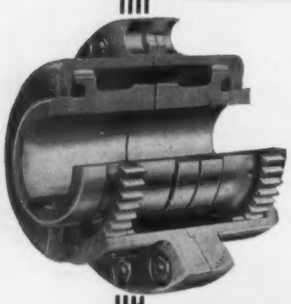

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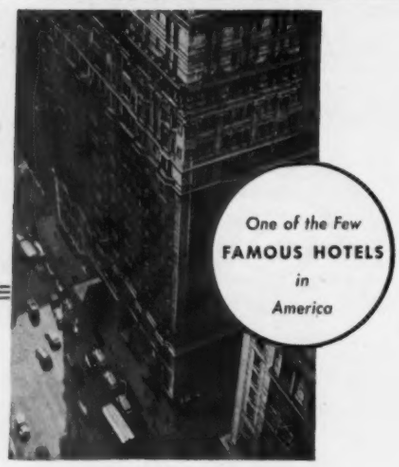

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—The Market Week—

Motorcar companies are starting to discuss steel tonnages for 1940 models, suggesting that purchases for the balance of runs on 1939 models will be restricted.

Cincinnati — Prices are softer; some dealers reducing their bids 25 cents a ton on most items. Scrap is moving steadily against contracts, with offerings adequate to make covering easy. Neither mills nor dealers show desire to build up scrap inventories.

St. Louis — The market is in the doldrums, with no consumer buying of importance pending. Prices are nominally unchanged at levels prevailing the past few weeks. Little scrap is coming in from the country, and no distress material is in the market.

Seattle—Picketing by Chinese and their sympathizers is prevalent at Pacific Northwest ports and scrap shipments are being delayed. Japanese buyers have turned to other sources of supply and ship owners hesitate to send vessels here. Rolling mills are buying considerable material paying $12 for No. 1 heavy melting and $11 for No. 2. Export prices are about $2 higher.

Toronto, Ont. — Scrap demand is slow, but supplies are becoming more plentiful, principally automobile material. Offerings of heavy melting steel are limited, while stocks of machinery cast are light in the face of steady demand from small consumers. No. 1 cast is at a premium, some users offering 50 cents above the market for this grade.

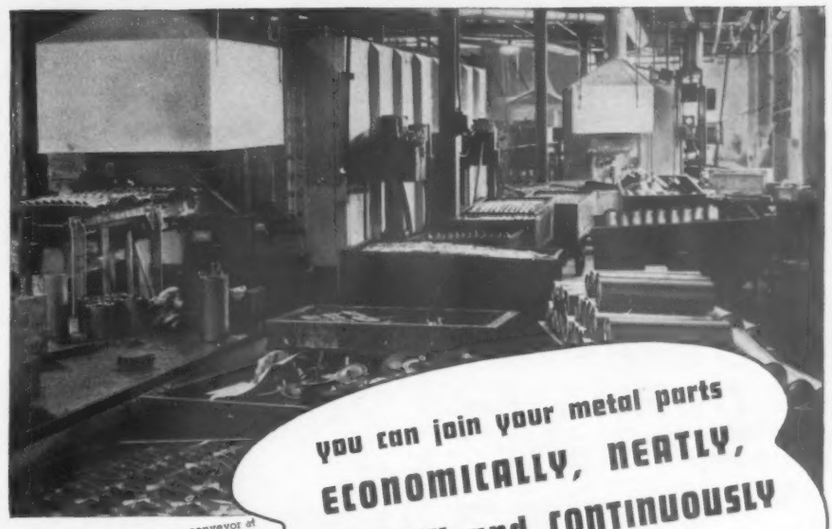
Warehouse

Warehouse Prices, Page 73

New York — Prime hot-rolled sheets, 8 to 30 gage, are no longer included in the hot-rolled quantity differential plan with plates, bars, shapes and other products and the price for such products is readjusted by district jobbers to 3.25c for 2000 pounds or more and 3.40c for 1999 pounds or less. There is no change in the price of 3/16-inch hot sheets, 14 to 18 inches wide, this grade and size continuing in the quantity differential plan at 3.73c.

Cleveland—Sales generally pursue a sidewise course, but some warehouses predict an upward trend during at least part of April. March business varied only slightly from February on a daily basis.

Philadelphia—March sales were the best since October, 1937, but the tendency in buying near the end of the month indicates April probably will not be comparable. Local ware-



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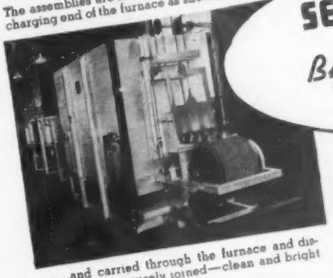
The assemblies are loaded on a conveyor at charging end of the furnace as shown below



. . . and carried through the furnace and discharged—securely joined—clean and bright

Intricate assemblies—large and small—are securely brazed in these furnaces. Investigate the brazing process. We will be glad to braze sample of your assemblies to show you the results you can get—also give you an estimate of installation and operating costs on furnace to handle your product and production.

Send for circular on the brazing process.

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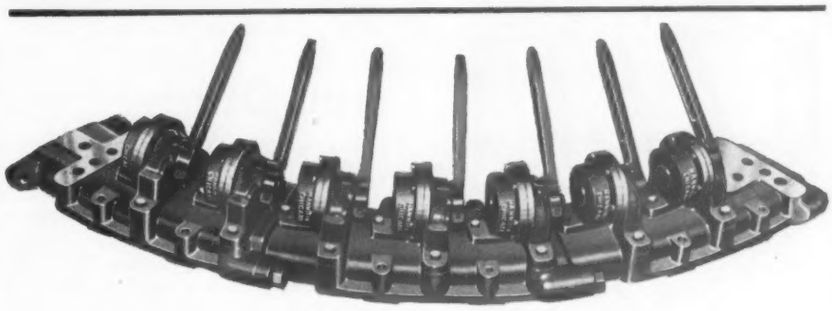

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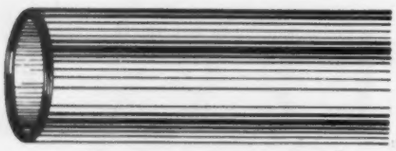

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ORDER FROM STOCK

houses have taken no action yet to revise hot-rolled sheets in line with the change at New York.

Chicago — Business is only steady but is regarded as fairly satisfactory. Despite absence of a definite trend, next changes are expected to be upward. Country buying continues ahead of city purchasing.

Buffalo — Although reports vary, March business as a whole was the best in about a year. Some distributors noted a falling off last month. Demand for structural items has not improved materially.

Detroit—Warehouses are awaiting release of programs for 1940 automobile models, most of which are unusually slow to become active. March business was ahead of February, but the gain was less than expected.

Cincinnati — Although individual orders are small, warehouse tonnage in March exhibits a sustained seasonal increase over the preceding month. Some jobbers estimate the gain over last year at 20 per cent. Prices are firm and unchanged.

Seattle—Volume of sales is below seasonal averages. Market is irregular, small lots predominating. Spring upturn has not yet appeared. Light sheets are probably in best demand. Prices are unchanged, well maintained in Washington, with Oregon dealers still trying to bring their price up to the Seattle level.

Iron Ore

Iron Ore Prices, Page 74

New York—Importers of Caucasian manganese ore are firming up their prices, with nominal offerings of 29 cents per unit, not including duty, on the 50 per cent grade. However, the market has not recently been tested at this level, as no important inquiries are being figured. South African manganese ore of comparable grade is also being offered now at approximately the same level. These higher offerings are regarded as reflecting the continued tense European political situation.

Other foreign ores, including iron, chrome and tungsten ores, are nominally unchanged, with too little business to provide a test.

Ferroalloys

Ferroalloy Prices, Page 72

New York—March shipments of ferromanganese were slightly ahead of February, due primarily to the longer month. A further small gain is expected in April. Meanwhile domestic prices are unchanged, while foreign quotations are somewhat stronger, following the withdrawal of low offerings from what was Czecholsovakia. Recent arrivals of foreign ferromanganese include more than 600 tons from Holland. Domestic spiegeleisen prices are unchanged, with shipments steady.

Steel in Europe

Foreign Steel Prices, Page 73

London — (*By Cable*) — Pig iron output is increasing in Great Britain as a result of heavy demands from steelworks and two blast furnaces are being blown in by Dorman, Long & Co. Ltd. The international situation is disturbing normal trade requirements but stimulating government contracts. Steelworks are well occupied, with semi-finished steel, sheets and light structurals in most demand.

The Continent reports export trade much disturbed with irregular demand, limited to small orders. A sale of Brazilian hematite iron ore is reported to have been made for Continental delivery.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 71

Bolt, nut and rivet business lagged during March. Specifications were maintained, but new buying barely held its own compared with February despite the longer month. Structural activity has given little stimulus to demand, but railroad buying for repair work is a little better though still light. Automotive orders have gained lately, with further improvement expected in April. Shipyard requirements are fairly well sustained.

New discounts have been announced on cap and set screws, effective immediately. Single discounts replace the old multiple figures and result in small increases in net prices. Similar discounts recently were adopted on bolts and nuts.

Brazil May Rebuild Navy from Scrap Sales

■ Funds for rebuilding the Brazilian navy will be obtained from exports of iron and steel scrap if the recommendation of President Vargas is adopted by the Brazilian Federal Trade council. It is estimated 1,000,000 tons of scrap is accumulated in yards, and a number of old ship hulls are lying useless in shipyards. President Vargas' proposal is to reclaim and sell for export all the scrap available for which there is no domestic outlet.

Bethlehem Operations Safest in Its History

■ Operations in 1938 were the safest on record for Bethlehem Steel Co. A comparative study of safety work just completed by the company's safety staff reveals that fewer accidents per man-hour occurred in its steel plants, in shipbuilding, mining and other operations than in any year in which special accident records have been kept. The monthly average number of workers last year was 82,680.

Since 1916 when the program of accident prevention was instituted accidents have been reduced by 80 per cent. Last year showed a reduction in accidents of 10 per cent as compared with 1937. During the past five years which represent 672,000,000 man-hours of employment, the study indicates accidents have been reduced by one half.

One of the features of last year's record was the operation of the Cambria plant, Johnstown, Pa., for a 91-day period, representing 3,217,736 man-hours, without a lost-time accident.

At another plant where a study of accidents was made in conjunction with the company's employe relief plan it developed that accidents that occurred outside the plant and that entitled the employes to relief payments were nearly three times more numerous than the "lost-time" accidents that took place in the plant. Automobiles took the heaviest toll among accidents that occurred outside the plant, with falls on sidewalks and streets ranking second, and falls in the home third.

A feature of safety promotion is to direct attention each month to some specific type of hazard.

Emphasis this year is placed on perfection of physical safeguards, such as making plant layouts safer, or the remedying of unsafe conditions from such causes as improper lighting, dress or apparel, or defective equipment. The emphasis last year was on the personal factor that so often contributes to accidents.

In a number of instances Bethlehem first-aid teams have saved the lives of employes who were in serious accidents, inside and outside the plant.

Nonferrous Metals

New York — Despite disturbing European political developments sentiment in nonferrous metal markets at the end of the first quarter was generally optimistic. Moderate gains in consumption during the first three months (amounting to

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound

	Copper										
Mar.	Electro, del. Conn.	Lake, del. Midwest	Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
25	11.25	11.37½	10.40	46.65	46.60	4.85	4.70	4.50	20.00	11.25	35.00
27	11.25	11.37½	10.37½	46.70	46.60	4.85	4.70	4.50	20.00	11.25	35.00
28	11.25	11.37½	10.37½	46.47½	46.40	4.85	4.70	4.50	20.00	11.25	35.00
29	11.25	11.37½	10.37½	46.62½	46.50	4.85	4.70	4.50	20.00	11.25	35.00
30	11.25	11.37½	10.25	46.50	46.40	4.85	4.70	4.50	20.00	11.50	35.00
31	11.25	11.37½	10.17½	46.50	46.40	4.85	4.70	4.50	20.00	11.50	35.00

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F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 11.25c Conn. copper

Sheets

Yellow brass (high) 17.31
Copper, hot rolled 19.37½
Lead, cut to jobbers 8.00
Zinc, 100 lb. base 9.75

Tubes

High yellow brass 20.06
Seamless copper 19.87½

Rods

High yellow brass 12.62
Copper, hot rolled 15.87½

Anodes

Copper, untrimmed 16.62½

Wire

Yellow brass (high) 17.56

OLD METALS

Nom. Del. Buying Prices

No. 1 Composition Red Brass

New York 6.37½-6.62½
Cleveland 7.25-7.50
Chicago 6.62½-6.87½
St. Louis 6.25-6.50

Heavy Copper and Wire

New York, No. 1 ..... 8.37½-8.50
Cleveland, No. 1 ..... 8.25-8.50
Chicago, No. 1 ..... 8.25-8.50
St. Louis 8.25-8.50

Composition Brass Borings

New York 5.62½-5.87½

Light Copper

New York 6.87½-7.12½
Cleveland 6.50-6.75
Chicago 6.62½-6.87½
St. Louis 6.50-6.75

Light Brass

Cleveland 4.25-4.50
Chicago 4.12½-4.37½
St. Louis 3.75-4.00

Lead

New York 4.10-4.35
Cleveland 3.50-3.75
Chicago 3.60-3.85
St. Louis 3.25-3.50

Zinc

New York 2.50-2.62½
Cleveland 2.00-2.25
St. Louis 2.00-2.25

Aluminum

Borings, Cleveland 6.25-6.50
Mixed, cast, Cleveland 7.75-8.00
Clips, soft, Cleveland 14.75-15.00
Mixed cast, St. Louis 7.75-8.25

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads .. 11.00
Standard No. 12 aluminum 12.50-13.00

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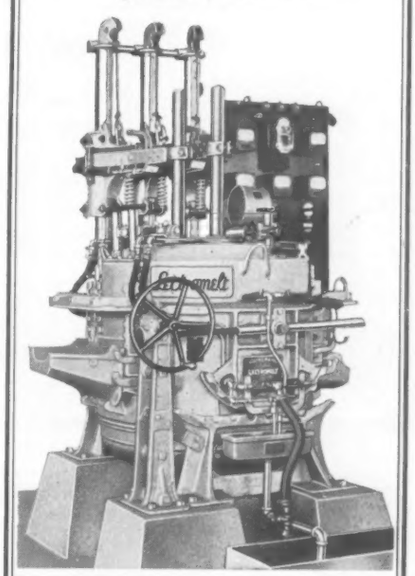

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20 points in tin plate operations, 10 points in galvanized sheet output, and 10 points in copper and brass mill operations) and a strengthening in price structures were among the favorable factors. The future trend depends greatly on how stable the foreign situation will be.

Copper—First-hand sellers' sales increased as less interest was shown in resale due to higher levels quoted in the outside market. Export copper held steady at 10.25c to 10.35c, c.i.f. while producers continued to quote electrolytic here at 11.25c, Connecticut.

Lead—Consumers' nearby requirements are well covered so purchases last week were confined mostly to fill-in tonnages. Prices held at 4.70c, East St. Louis, and 4.85c, New York.

Zinc—A rise of $1 per ton in zinc ore prices worsened the unfavorable price position from a producers' view of the primary zinc market. An advance here from the 4.50-cent East St. Louis level is prevented by the depressing effect of the low London market.

Tin—Straits spot prices fluctuated between 46.47½c to 46.70c in line with changes in London tin and Wall street security price trends. Buying was spotty with a substantial volume of business booked on a few days.

Antimony — American antimony prices advanced ¼-cent on Thursday to the basis of 11.50c, New York, for spot and 11.25c, shipment in bulk from smelter. Chinese spot held nominally unchanged at 14.00c, duty paid New York.

Lewis B. Lindemuth
Consulting Engineer
134 East 47th Street
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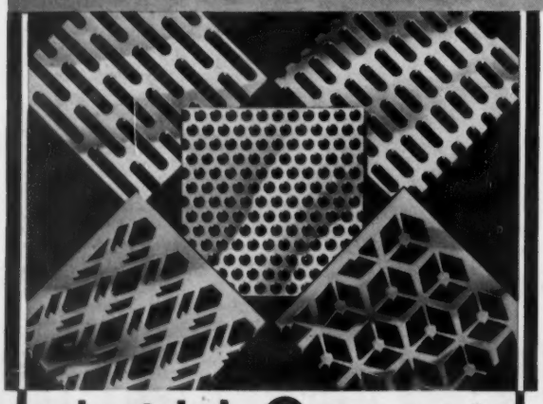

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Equipment

New York—Harnischfeger Corp., Milwaukee, appears low on most, if not all, of 38 electric overhead traveling bridge cranes for installation at navy yards, Boston, New York, Philadelphia, Charleston, Norfolk, Mare Island and Puget Sound. This firm bid $498,932, March 29, the inquiry being the largest bridge crane inquiry in recent years. However, specifications include several alternates for part of the work only and final awards may be distributed among several builders. Cranes are from 25 to 175-ton capacity.

Chicago—March sales of heavy equipment were reported the best in over a year by a leading interest. General demand for machine tools has been good, although a slight spottiness, believed only temporary, developed the last few days of March. April outlook is good, with inquiries active, and much work pending. Chicago sales have improved recently, although still below country orders from neighboring towns and states. Agricultural demand is expected to increase shortly. Railroad requirements have increased in some quarters.

Seattle—Mining machinery is in better demand but cannery plant equipment is not being placed, as operators are unable to plan season's program while labor disputes continue. Electrical items are moving well and automotive equipment is also active. Bonneville authority, Portland, Oreg., has called bids April 17 for 23-KV oil circuit breakers for Raymond substation; April 3 for 12 transformers for Ampere station, Spec. 224; April 10 for constructing building and equipment, Eugene station; April 8 for wire, hardware, metering outfits; March 31 for 33,000 feet of wrought iron pipe, pipe cutters and other equipment.

Construction and Enterprise

New York

CLARENCE CENTER, N. Y.—National Gypsum Co., Buffalo, plans to construct a plant addition here at estimated cost of approximately $40,000.

NEW YORK—Bee-Ess Iron Works Inc. has been organized with a capital of $10,000 to deal in iron products. B. Robbins, 25 Warren street, New York, representative.

NEW YORK—Safeway Steel Scaffolds Supply Corp. has been formed with $50,000 capital to manufacture steel ladders, material hoists and hod hoists. Joseph Byrne, 551 Fifth avenue, New York, is company's representative.

WATERTOWN, N. Y.—Central New York Power Corp. plans to extend its electric facilities in four counties at cost of $1,326,000. Project includes construction of an electric power plant and purchase of new equipment. R. W. Porter, vice president, in charge.

Connecticut

NEW LONDON, CONN.—City is preparing plans for construction of a sewage disposal plant costing about $600,000 at Ft. Trumbull. Solomon & Keis, Troy, N. Y., consulting engineers.

WEST HARTFORD, CONN.—Pratt & Whitney division of Niles-Bement-Pond Co., C. R. Burt, president, Hartford, Conn., has let general contract for constructing a one-story, 520 x 960-foot, and two-story, 150 x 250-foot machine tool shop costing nearly $3,000,000, to James Stewart Co., 230 Park avenue, New York.

Massachusetts

WOLLASTON, MASS.—Howard Johnson Co. has plans underway for constructing a 100 x 100-foot plant addition estimated to cost approximately $75,000.

New Jersey

ATLANTIC CITY, N. J.—Atlantic City Electric Co. proposes to make extensions in its steam electric power plant, including installation of considerable new equipment.

Pennsylvania

KNOX, PA.—U. S. Fibre Box Co., H. J. Lacy Sr., president, Indianapolis, proposes to build a one-story factory building costing $40,000.

Ohio

CINCINNATI—City, C. O. Sherrill, city manager, plans to make improvements in its waterworks at cost of $12,000.

GALLIPOLIS, O.—Buckeye Rural Electric association, O. E. Elliott, president, has been allotted a $154,000 loan by REA for construction of 152 miles rural power transmission lines through two counties.

LIMA, O.—City, A. L. Metheany, mayor, plans to double capacity of its water reservoir and erect two water tanks at cost of $468,000. Will mature about July. Thomas Quinn, city engineer.

NORTHFIELD, O.—State welfare department, Charles Sherwood, director, Columbus, O., will advertise soon for bids on a new boiler, three stokers and a 400-horsepower engine and generator costing total of $100,000. R. G. Ingleson, Columbus, consulting engineer.

Michigan

EAST LANSING, MICH. — Michigan State college is planning to purchase a new generator and condenser, auxiliary equipment, 12-feed switchboard, ash handling system, water softener and deep well pump. Total cost, $500,000.

HILLSDALE, MICH.—City is taking bids due at 7:30 p. m., April 10, on changes in its electrical equipment and distribution system, involving new switchgear, transformers, etc. Hamilton & Weeber, Grand Rapids, Mich., consulting engineer.

Illinois

CHICAGO—Mackray Metal Mfg. Co. has incorporated with 100 shares no par value common stock to deal in metals. Correspondents, Burry, Johnston, Peters & Dixon, 105 South LaSalle street, Chicago.

CHICAGO—Olive Can Co. has awarded contract to Stroebel & Hall, 192 North Clark street, Chicago, for constructing a one-story, 60 x 100-foot factory costing an estimated $40,000.

CICERO, ILL.—Kropp Forge Co. will soon take bids on construction of a proposed one-story, 80 x 200-foot forging plant costing about $40,000. Meyer & Cook, Cicero, architects.

Indiana

BREMEN, IND.—Bremen Gray Iron Foundry Inc. has been formed by Harold S. Heckman, C. W. Kling and Ellis Brown, Bremen, with capital of $15,000, to operate a foundry.

INDIANAPOLIS—Wheel Equipment Co. Inc., 2821 Roosevelt avenue, Indianapolis, has been organized with 100 shares no par value capital stock to manufacture steel wheels and allied equipment. George S. Humes, B. E. Rader and C. L. Rader, Indianapolis, incorporators.

INDIANAPOLIS — Radio Corp. of America, H. E. Le Roy, local manager, 501 North LaSalle street, has awarded general contract for constructing a one-story, 285 x 358-foot assembly plant and power house costing about $250,000, to J. L. Simmons & Co. Inc., Union Title building, Indianapolis.

South Carolina

GREENVILLE, S. C.—Greater Greenville sewer district commission asks bids until April 14 on construction of a sewage disposal plant costing $829,000. J. E. Sirrine & Co., Greenville, consulting engineers.

Oklahoma

VINITA, OKLA.—Grand River dam authority, O. Butler, secretary, takes bids until April 11 for constructing a 300,000-gallon per day sand filter plant and pumping station at cost of $59,850. Holway & Neuffer, Tulsa, Okla., consulting engineers.

Missouri

KIRKWOOD, MO.—City, A. S. Kinyon, mayor, receives bids April 21 for constructing an electric substation and whiteway. Black & Veatch, Kansas City, Mo., consulting engineers. (Noted Dec. 19.)

ROCKPORT, MO.—Atchison-Holt Electric co-operative, W. C. Scamman, president, has awarded contract to the Schneider Electric Co., Omaha, Nebr., at $98,327, for the construction of approximately 138 miles of rural electric power lines in five counties. H. H. Henningson Engineering Co., Omaha, Nebr., consulting engineer. (Noted March 20.)

ST. LOUIS—Mines Equipment Co., J. B.

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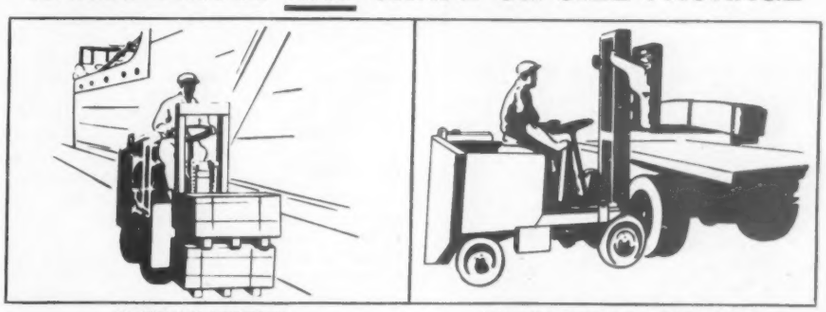

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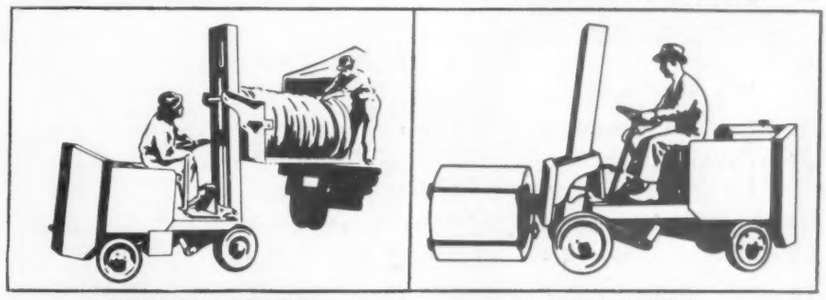

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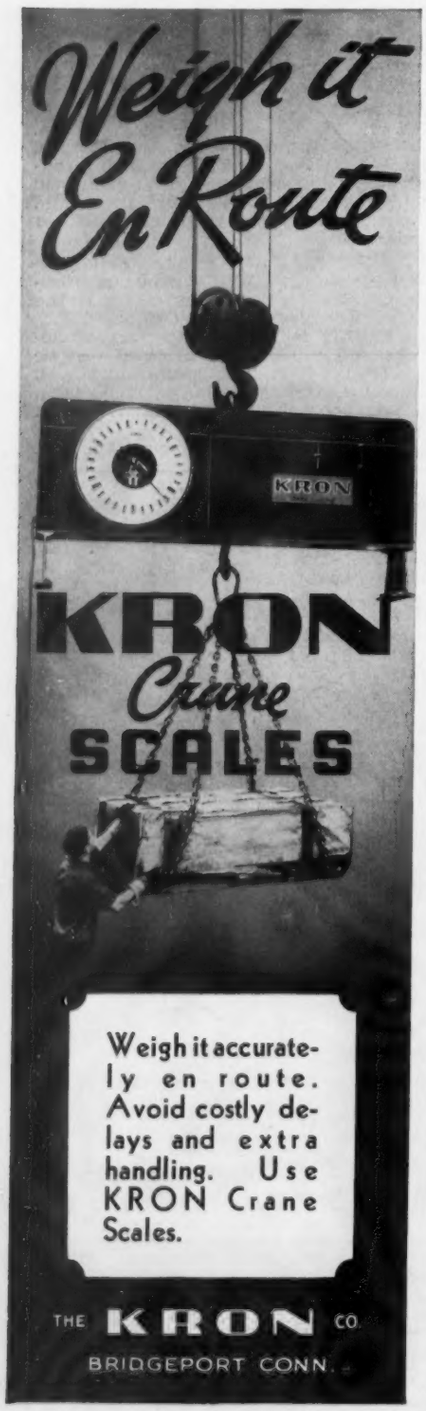
Miller, president, manufacturer of mining equipment and supplies, is taking bids on general contract for constructing a one-story plant addition, 9975 square feet, and improving present building. Total cost of construction and new equipment estimated at $50,000.

Wisconsin

MANITOWOC, WIS.—Kieckhefer Container Corp., John W. Kieckhefer, president, Milwaukee, manufacturer of corrugated boxes, will begin construction about May 1 of a new 70,000-square foot factory here.

PLATTEVILLE, WIS.—Tri-state Power co-operative, E. J. Stoneham, president, plans to construct a steam generating plant costing $500,000. E. A. Taylor, St. Louis, consulting engineer.



Minnesota

MANKATO, MINN.—Blue Earth Nicollet Co-operative Electric association, Fred Weaver, secretary, is taking bids until 2 p.m., April 10, on the construction of about 300 miles of rural transmission lines in nine counties. Certified check 5 per cent to accompany bids. Ellerbe & Co., St. Paul, consulting engineers.

SPRINGFIELD, MINN.—City, A. C. Mueller, clerk, is receiving bids until 7:30 p.m., April 12, on boiler, stoker, turbine, condenser and crane for its power plant. Charles Foster, Duluth, engineer.

Texas

ALICE, TEX.—City plans to construct a sewage disposal plant and has voted to issue $15,000 bonds to finance project.

AUSTIN, TEX.—Lower Colorado River authority, Fritz Englehard, chairman of board of directors, 806 Littlefield building, receives bids April 28 for turbines, governors and generators for power plant at Marshall Ford dam.

PALESTINE, TEX. — Tidewater and Seaboard Oil companies have awarded joint contract to J. F. Pritchard & Co., Kansas City, Mo., for constructing a gasoline processing and recycling plant at cost of about $300,000.

Iowa

HARTLEY, IOWA — Village, Gwen Guenther, clerk, is taking bids to 2 p.m., April 25, on a 450-horsepower diesel engine for installation in its power plant. Certified check 5 per cent on Iowa bank to accompany bid.

SIOUX CITY, IOWA—Woodbury County Rural Electric co-operative, C. L. Brown, president, will take bids this month on construction of 119 miles of rural electric transmission lines. Buell & Winter Engineering Co., Sioux City, consultant. (Noted March 6.)

VILLISCA, IOWA—Municipal power plant trustees, C. G. Hilleary, secretary, takes bids until 10 a.m., April 18, on diesel generator units and auxiliary equipment, switchboard, new heating system, etc., for its plant. A. S. Harrington, Omaha, Nebr., engineer. (Noted March 20.)

Montana

TWIN BRIDGES, MONT.—REA has allotted $94,000 to Jefferson Valley Rural Electric co-operative, William Heaston, superintendent, to finance construction of 80 miles of rural electric transmission lines in three counties. J. M. Garrison, state water conservation board, Helena, Mont., consulting engineer.

Idaho

BOISE, IDAHO—Forestry service plans to build a machine shop for civilian conservation corps. Will include warehouse, gas and oil storage, heating plant and machinery.

Pacific Coast

BRIGHTWOOD, OREG.—Mt. Hood water district, E. G. Chaplin, commissioner, plans to construct a water system costing $125,000. Bond issue is to supplement WPA funds.

PORTLAND, OREG.—Bonneville power project, 811 Northeast Oregon street, asks bids until April 17 for two 23-kilovolt oil circuit breakers for substation use. (Bid 217.)

SEATTLE—J. R. Sousa and Gerald T. Mason, beverage distributors, plan to install motors and controls, conveyors and other equipment in constructing a bottling plant to cost about $200,000. W. J. Bain, Seattle, engineer.

Canada

HAMILTON, ONT.—Hamilton Facing Mill Co. Ltd. plans to rebuild its five-story factory for making foundry molds. Cost estimated at about $50,000.

MT. DENNIS, ONT.—Canadian Kodak Co. Ltd., S. B. Cornell, manager, will soon take bids on construction of a four-story, 73 x 153-foot plant extension costing approximately $40,000.

QUEBEC, QUE.—City, F. X. Chouinard, clerk, proposes to purchase a mechanical filter costing $35,000 for installation in its water plant. E. Hamel, city engineer.

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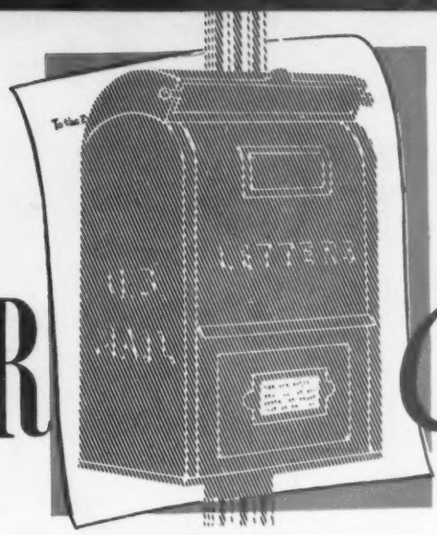


Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Praise Well Merited

To the Editor:

Praise accorded the collector of scrap metals by James S. Earle of the bureau of mines recently before the National Association of Waste Material Dealers at Chicago, (STEEL, March 27, page 20) is well deserved. The service of this branch of industry is, as he said, the most effective contribution to conservation of natural resources.

Aside from the scrap produced in the steel mills and recycled and the scrap byproduct of industrial operations, such as the canmaking and automobile industries, an important part of the tonnage is collected by small dealers who handle material gathered at the periphery of the great pool. Without their work a tremendous tonnage would be lost, left unreclaimed.

Often these collectors must risk their money in accumulating stocks at a time when prices are too low to warrant them in selling, and must hold their accumulations until a turn of the market puts the price above the profit line. It is a well-known phenomenon of the scrap market that every dollar rise in price widens the circle from which reclaimed scrap can be shipped to consuming centers. Conversely every decline narrows the circle.

When it is considered that every ton of steel or iron scrap represents approximately two tons of iron ore, as well as coke and limestone, it can be seen that every ton of scrap returned to the steel mill represents conservation of this quantity of raw material.

As a matter of fact, production of steel from scrap cuts out a considerable number of operations necessary in making it from iron ore, thus saving time and often giving a product requiring less refining.

In recent years the growth of the scrap industry to the stature of a real business has been marked by its internal efforts to govern itself and eradicate evils that had existed, putting it on a high plane. Formation of voluntary organizations, such as the Institute of Scrap Iron and Steel Inc., has done much to strengthen its position and it has become a leading member of the industries intimately connected with the production of steel.

BROKER.

Pittsburgh

Reason on Way Back

To the Editor:

Indications are that the worst is past in the matter of business badgering by hostile legislation fostered by extreme labor interests. Now that some of the restrictive laws are reaching the courts they are being thrown out and their utterly unfair character proved by legal scrutiny.

One of the most flagrant violations of business rights was the "Little New Deal" put over in the administration of Governor Earle of Pennsylvania. It provided such impossible conditions that business simply could not continue operation indefinitely. The court's opinion that its conditions were "grossly unfair" is putting the case mildly. Further clarification of the maximum rates of compensation is awaited, the court indicating a rule of reason should be applied in this.

It seems that the day of radical labor's roughshod ride over the rights of the remainder of the people has reached its end and that reason again will assert its sway. Signs indicate the pendulum is swinging the other way and that conditions will be improved as the unfairness and burdensome effects are brought into the open.

JOHN MOORE

Philadelphia

Steel Wage Level Helps

To the Editor:

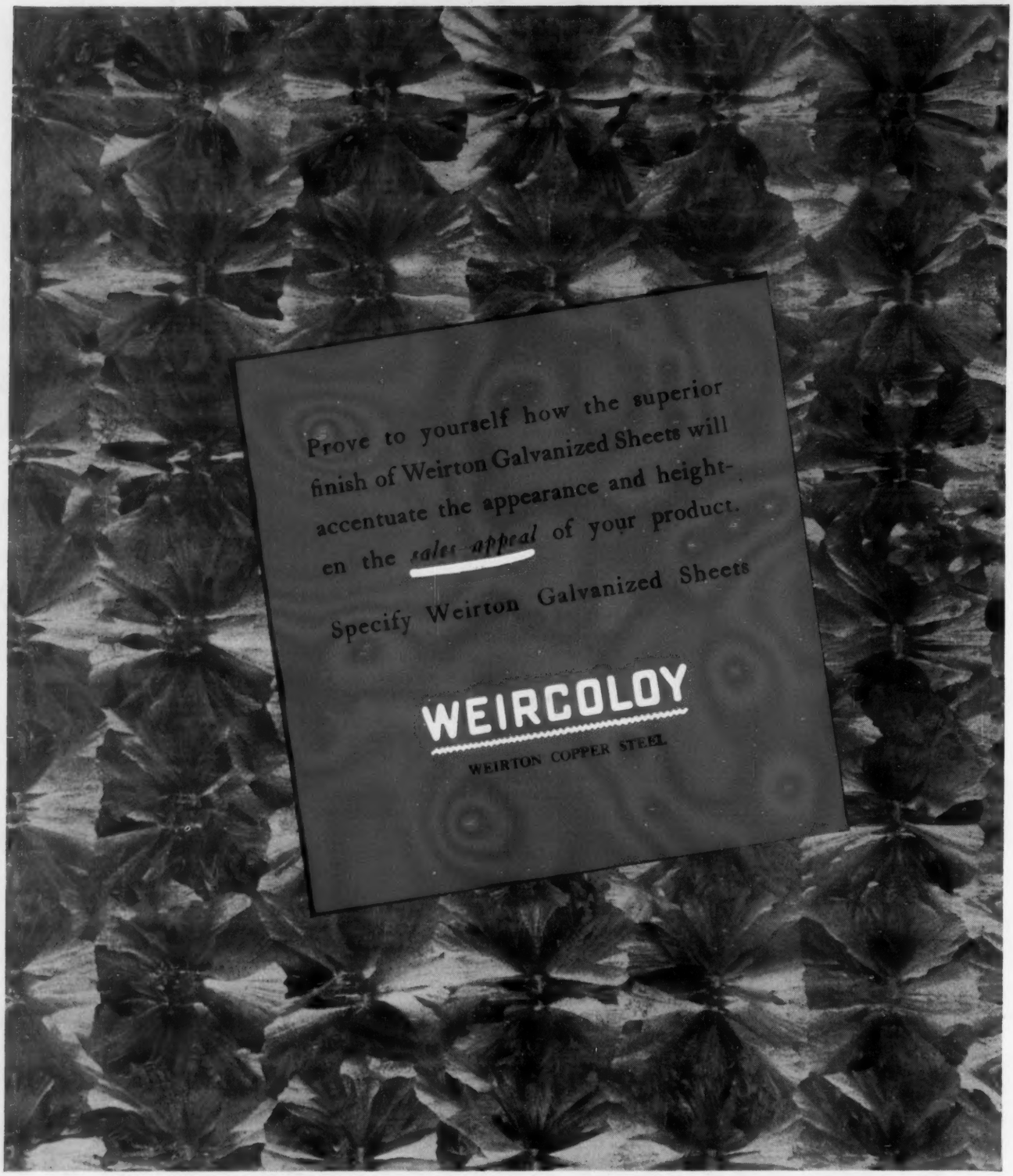
Critics of business relations with labor should find something to think about in the report of the American Iron and Steel institute on employment and wages, STEEL, April 3, page 19. With 453,000 employes in February, compared with 461,000 a year ago, the wage total was 25 per cent higher.

This increased payroll probably is one factor in the long list of companies reporting deficits in earnings. But the industry is doing its share to increase purchasing power and if volume of production were increased sufficiently there would be a profit for stockholders as well as for workers.

The steel industry certainly is doing its share to improve conditions and should be commended for it.

STEELWORKER

Youngstown, O.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